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CLEVELAND'S MUNICIPAL ELECTRIC LIGHT PLANT

Largest Municipal Central Station in the Country—Result of Nine Months' Operation—Special Features to Secure Economy of Operation—High Voltage Alternating Current Transmitted—Financial Statement

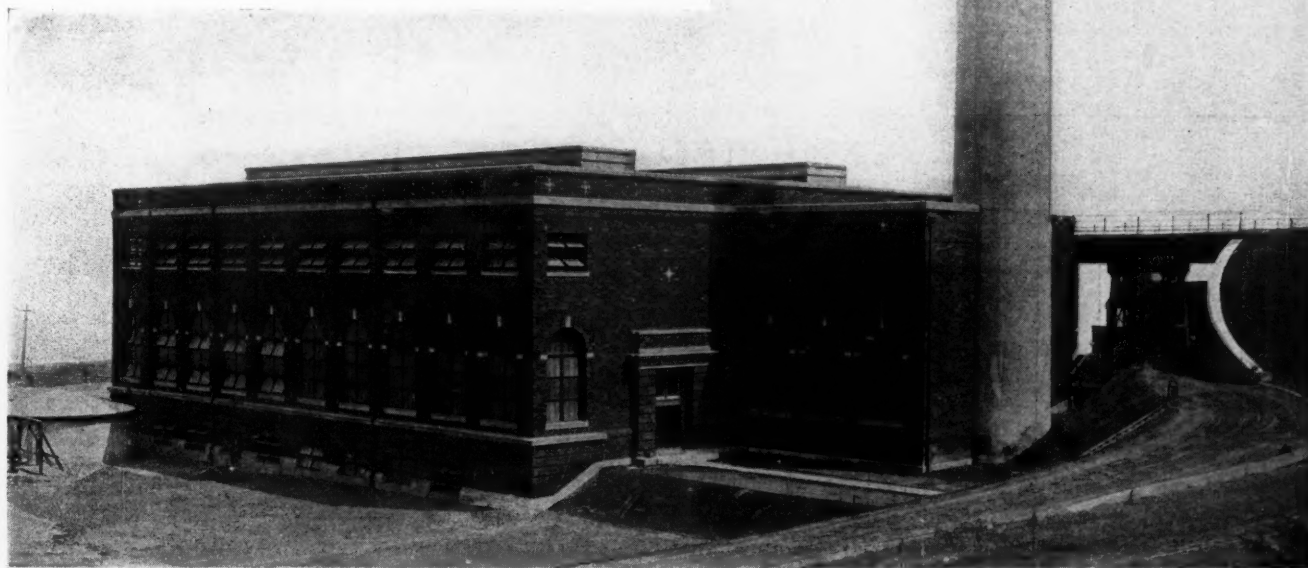
Cleveland's new municipal lighting station, which is the largest central station to be built by a municipality in this country and which will supply current for power users as well as for street and commercial lighting, went into operation late in July, 1914. The station has a capacity of 25,000 k.w. and at present is loaded to about one-third its capacity. In the commercial lighting it has to compete with a private company which at present has about six times as many customers as has the municipal plant.

The decision to build this plant by the city was the result of experience with a station of 1,500 k.w., capacity, which had been operated by the city since 1906. This station was started with a bond issue of \$30,000 and had, by appropriations amounting in all to \$211,649.22 and with additions to the plant by profits and earnings, grown to a total investment in plant value of \$548,182.43, thus acquiring more than one-half its total value in eight years from the earnings of the plant itself.

The new plant, which is of especial interest because of the many features to secure maximum economy, is known as the East 53rd St. Station. It contains three large generating units of 7,500 k.w. capacity each and one unit of 1,500 k.w. and is intended to supply current for lighting and power uses throughout the entire territory covered by the city of Cleveland. The plant was built from the proceeds of a bond issue of \$2,000,000, about one-half of which amount has been invested in

the station itself, and the other half is being invested in the distribution system, including overhead and underground lines and substations. In addition to the proceeds from the bond issue, \$500,000 was voted by the city, making a total of \$1,500,000 to be invested in the distribution system.

There are at present two other plants, known as the Brooklyn and Collinwood plants, the value of whose distribution systems is about \$500,000. The operation of the Brooklyn station has been discontinued, but the

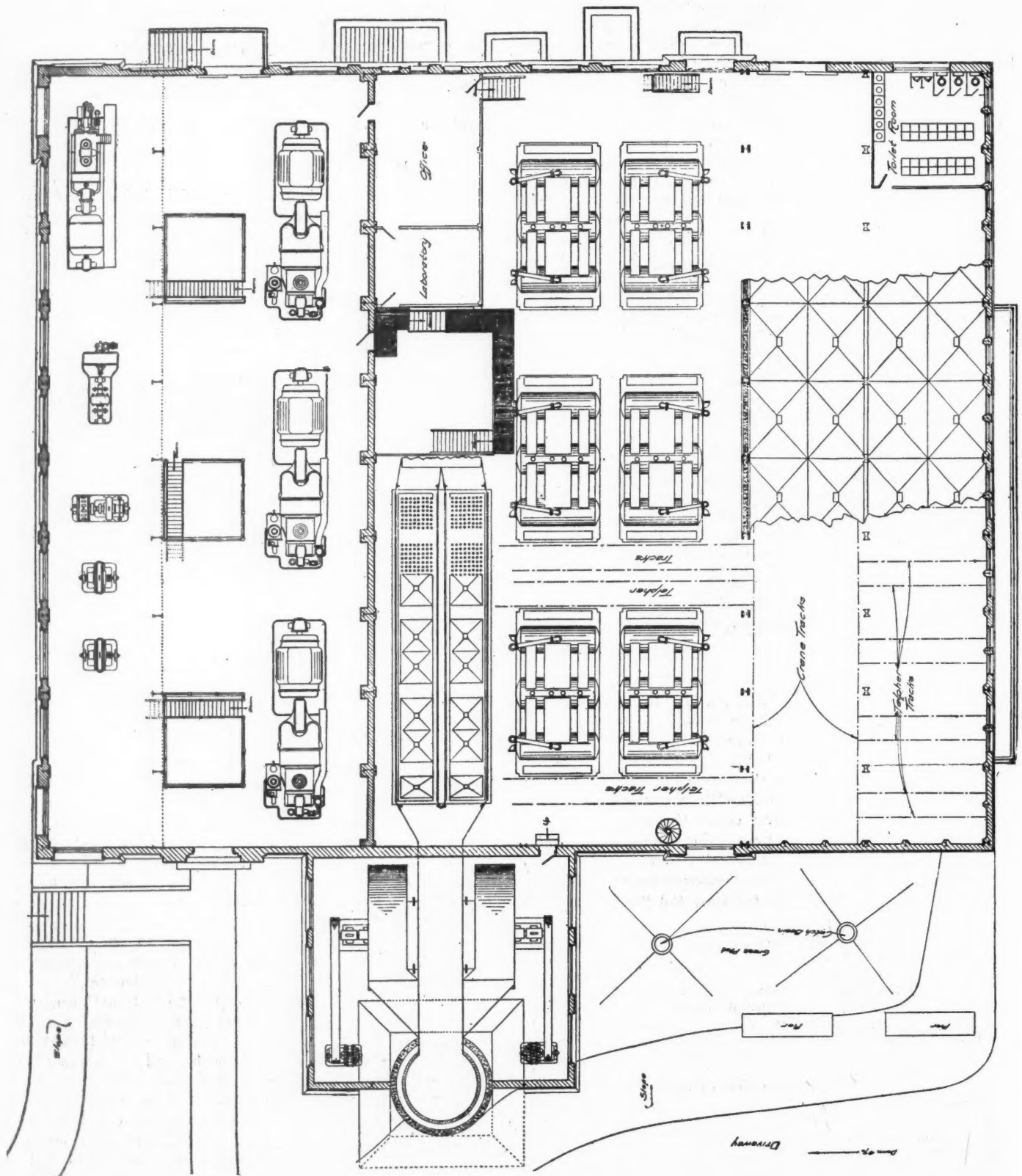


EAST FIFTY-THIRD STREET STATION, CLEVELAND MUNICIPAL LIGHTING PLANT.

other plant is still being operated, though it probably will be shut down in the near future.

Very complete figures were kept of the operation and maintenance of the Brooklyn station. Using these as a basis, the rates at which current would be sold and the results which would be obtained from the operation of the new station were announced in advance. To do this it was, of course, necessary to make certain definite assumptions in regard to the costs and various items of expense, based on those of the Brooklyn station, and at

the same time to take carefully into consideration the lower costs which could be secured by the greater efficiencies which it was believed could be obtained. Where any element of uncertainty existed as to just how much the costs could be lowered, the operating figures for the Brooklyn station were used. It was necessary first to estimate what should be allowed for certain fixed charges, consisting of interest on the investment, allowance for the depreciation or amortization, and a due allowance for taxes, which, of course, the city does not



FLOOR PLAN OF CLEVELAND LIGHTING PLANT.

pay but which should be allowed for since the city's tax income is reduced by that amount. The amount realized from bonds and the plant value make the total investment about \$3,000,000. By allowing an average of $4\frac{1}{2}$ per cent on this (the bonds were sold on a 4.27 basis), $1\frac{1}{2}$ per cent for taxes and 3 per cent for amortization, an annual allowance of 9 per cent for fixed charges is required.

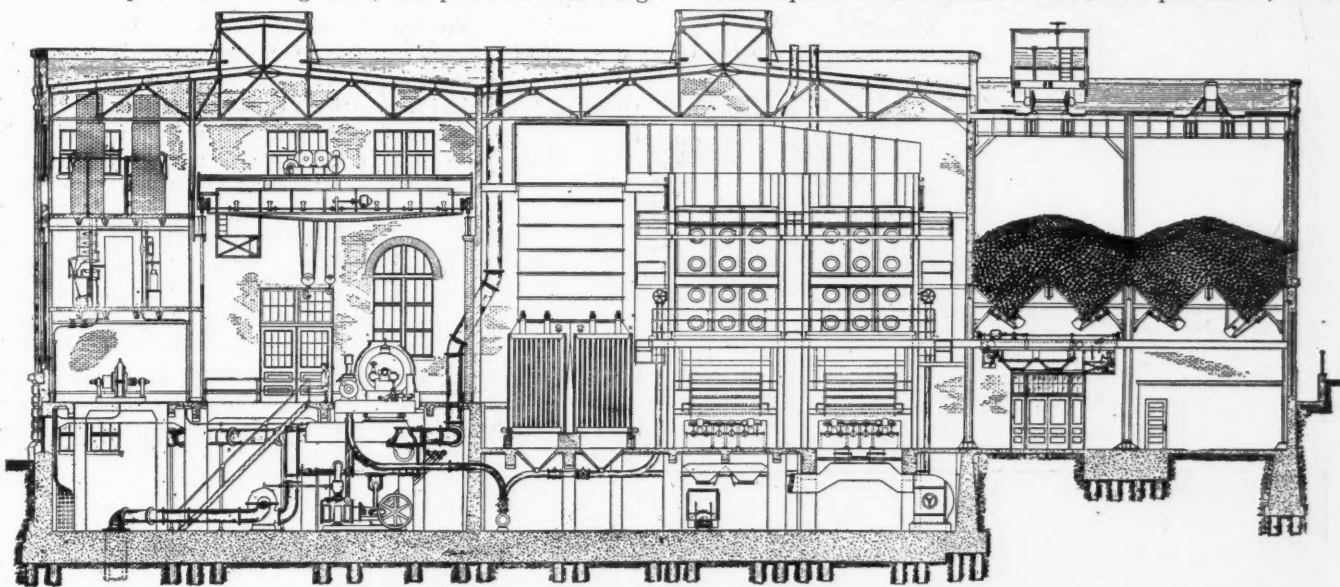
In order to arrive at the estimated unit cost for the fixed charges, it was necessary to assume a certain total output for the station for a year. A 40 per cent load factor was assumed as being attainable and this, with a peak load of 18,000 k.w., would give a total yearly output of about 60,000,000 k.w.h. Fixed charges for the entire plant investment of \$3,000,000 rated at 9 per cent would amount to \$270,000 per year and this on the above output per k.w.h. would be \$0.0045 or \$0.0015 for the station cost and \$0.003 for the distribution cost.

In regard to the proper estimate on the unit cost of coal sufficient data were available from the known efficiencies of stations of this kind to warrant an estimate of \$0.002 per k.w.h. being used, the price of coal rang-

the figure obtained in practice at the Brooklyn station, was adopted.

In addition, the item for fixed charges was valued at \$0.003; while \$0.0005 was used as being a conservative estimate for administration charges, taking into consideration the known cost in connection with the operation of the Brooklyn plant, the additions which would be required to operate the business on such increased magnitude as would be necessary for the larger station operating the full capacity, and also the increased output from the larger station.

These items thus described cover the entire cost of operation and maintenance, including the fixed charges of interest, taxes and depreciation; but in order to be perfectly fair in making a comparison with privately owned and operated plants, an allowance of 8 per cent should be made for profit, as this is the amount generally allowed by public utility commissions in the various states as that necessary to give a market value to the securities of this class of public utility property. Eight per cent on the investment price of \$3,000,000 would equal an additional cost of \$0.004 per k.w.h., mak-



CROSS-SECTION OF CLEVELAND LIGHTING PLANT.

ing from \$1.60 to \$1.70 per ton, with a thermal efficiency of from 13,000 to 13,500 b.t.u. per pound of coal.

Many data are available in regard to unit costs for labor, maintenance and sundries in a station of this character. The most reliable figures agreed very well with those secured from the operation of the Brooklyn station and the value of \$0.0015 was adopted. Under the heading of distribution costs, the estimate includes but two items. One of these is for operation and maintenance and the figure of \$0.004 per k.w.h., which was

ing a total average price of \$0.0165, which it would be necessary to secure for the total k.w.h. generated at the station.

The location of the new station was determined not so much by the proximity of a desirable load for the station as by the question of the most convenient and economical location for delivering coal and also by the possibility for securing in the cheapest manner the very best water for condensing purposes. At this place water, cool and pure, could be obtained from a 9-ft. tunnel (owned by the water department), which extends 5 miles into Lake Erie. It was decided to use the water and return it to the aqueduct after passing through the surface condensers. An objection to this would be the increased temperature of the water, but it was estimated that the increase would not exceed one degree F.

The coal question was considered of almost equal importance. At the spot selected, the railway tracks run along the edge of the property and at 60 feet higher elevation, so that coal can be discharged by gravity into the bunkers (which have a capacity of 3,400 tons), from which it is drawn through gates under pneumatic control into an electric telfer, which moves back and forth under the bunkers on a track leading out over the stoker hoppers, which in turn are filled by gravity. The coal hopper on this telfer is carried on scale beams and the weight of coal and the time of delivery is recorded.

Estimate of Unit Costs for East 53d Street Station.

Coal	\$ 0.002
Labor, maintenance, sundries.....	0.0015
Fixed charges	0.0015
Total Station charges.....	0.005
Distribution Costs.	
Operation and maintenance.....	0.004
Fixed charges	0.003
Total	0.007
Administration Charges.	
Administration charges	0.0005
Total amount cost.....	0.0125
Profit required	0.004
Average sale price required.....	0.0165
Estimated K.W.H.	60,000,000

The special features in connection with the design of this station which are different from standard practice are as follows: The use of motor-driven auxiliaries exclusively throughout the plant; the use of large boiler units with high pressure; the use of economizers of much greater capacity than ordinarily installed; a new arrangement of coal handing apparatus; the use of both forced and induced draft with practically atmospheric pressure in the combustion chamber; the automatic control of furnace conditions; the simplicity of piping layout, due to motor driven auxiliaries; the use of an auxiliary steam turbine for driving the auxiliary motors. This turbine is supplied with a jet condenser, whose

cooling water is the boiler feedwater before going to the economizers.

The use of large boilers was decided on and those installed are of the Stirling type with 10,134 square feet of heating surface and equipped with superheaters for supplying steam at 125 degrees Fahr. The working pressure is 250 pounds gauge pressure. Each boiler is equipped with two Taylor stokers of six retorts, or a total of twelve retorts per boiler.

In the chief engineer's office are located indicating and recording instruments for practically every operation in the station. There is a graphic recording totalizing watt-meter which gives a continuous record of the combined output of the entire station. The amount of feed-water going to the boilers is shown by the indicating dial of a Lea V-notch recorder, which also gives a continuous graphic record and the total quantity by means of integrating dials. The CO₂ in the flue gases is recorded here by a Simmance-Abady machine; while recording thermometers keep record of the temperature of feed-water entering and leaving the economizer, the temperature of the flue gases in the boiler breechings as well as at the discharge end of the economizer. The steam pressure and also the temperature of the steam in the main header is also recorded here, thus giving a record of the superheat. This information, together with the record of the weight of coal going to each boiler, which is turned in to the chief engineer at the end of each 8-hour shift, enables him to have a complete log of the performance of the station made up every day. Seated at his desk he can see at a glance what is going on in any part of his plant, from the total number of kilowatts which are being put out by the station, to the temperature of the flue gases and of the boiler feed water. He knows at the end of the day how many pounds of coal have been used in each of his boilers, how many pounds of water have been evaporated into steam, the number of kilowatt-hours which have been generated and the exact efficiency of his plant and the cost per kilowatt-hour for that day.

Perhaps the most important innovation in connection with the operation of the station is not in the station itself, but in transmission of high voltage alternating current. In central station practice in large cities it seems to have become a fixed rule to supply the congested districts with direct current through 220-volt 3-wire Edison systems. This has resulted in an enormous investment in copper, the fixed charges on which, such as interest, depreciation and taxes, add greatly to the cost of the service. There is also a much greater loss in transmission at the low voltages and also the loss of from 15 per cent to 20 per cent in transformation from alternating to direct current in the substations. A greater number of substations are needed than would be required for alternating current distribution.

It is a fact that nearly all lighting and power requirements can be met in congested districts with alternating as well as with direct current. The cases in which the use of direct current are advantageous are really a small percentage of the whole. In power work there are places where finer gradations of speed control than can be secured with alternating current are desirable,

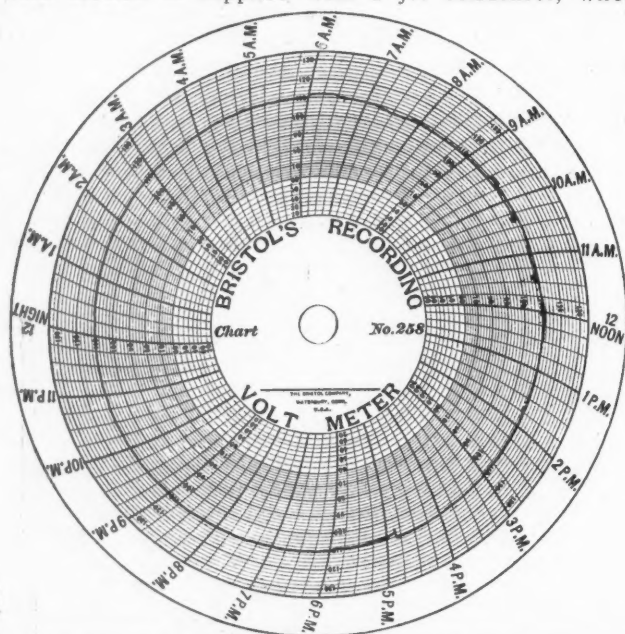
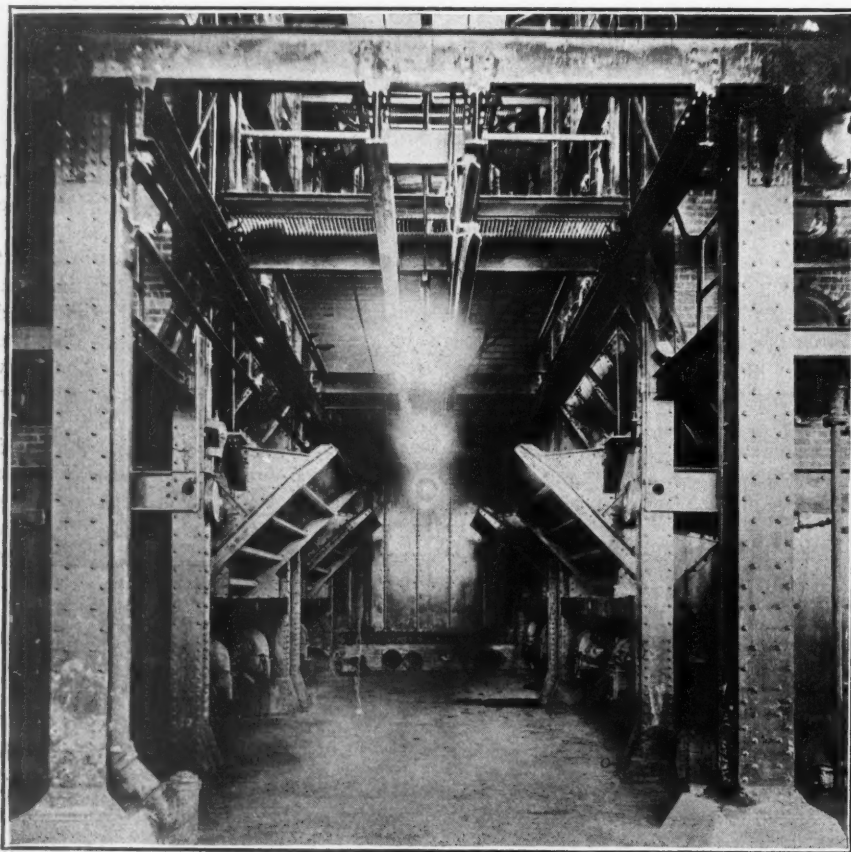


CHART SHOWING VOLTAGE REGULATION ON MUNICIPAL LIGHT AND POWER DISTRIBUTION SYSTEM.



AISLE BETWEEN BOILERS.

and in lighting work there are places where storage batteries are necessary to provide an absolute security against interruption of service. But it was found that it would be more economical to handle such cases on the premises and install there the necessary converters, accumulators, etc. The estimate for such costs was considerably less than that additionally required for the transmission of low voltage direct current from substations.

REVENUE AND EXPENSE STATEMENT FOR YEAR 1912

Total revenue from sale of current for year 1912.....	\$139,646.33
Kw-hrs. generated... 4,611,853	Average sale price...\$0.0302
Kw-hrs. sold 3,766,265	Average sale price...\$0.0370
Total operation and maintenance expense for year.....	77,655.67
Kw-hrs. generated... 4,611,853	Average cost price...\$0.0167
Kw-hrs. sold 3,766,265	Average cost price...\$0.0206

Net earnings	\$61,990.66
Fixed charges—depreciation and interest	15,492.15
Kw-hrs. generated... 4,611,853	Average cost price...\$0.0033
Kw-hrs. sold 3,766,265	Average cost price...\$0.0041

Profit for year of 1912	\$46,498.51
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REVENUE AND EXPENSE STATEMENT FOR YEAR 1913

Total revenue from sale of current for year 1913	\$185,698.81
Kw-hrs. generated... 7,797,661	Average sale price...\$0.0238
Kw-hrs. sold 5,656,668	Average sale price...\$0.0328
Total operation and maintenance expense for year.....	116,719.55
Kw-hrs. generated... 7,797,661	Average cost price...\$0.0149
Kw-hrs. sold 5,656,668	Average cost price...\$0.0206

Net earnings	\$68,979.26
Fixed charges—depreciation and interest	19,079.50
Kw-hrs. generated... 7,797,661	Average cost price...\$0.0024
Kw-hrs. sold 5,656,668	Average cost price...\$0.0033

Profit for year of 1913	\$49,899.76
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REVENUE AND EXPENSE STATEMENT FOR YEAR 1914

Total revenue from sale of current for year 1914	\$298,562.54
Kw-hrs. generated... 14,912,634	Average sale price...\$0.0200
Kw-hrs. sold 11,221,933	Average sale price...\$0.0266
Total operation and maintenance expense for year.....	210,100.34
Kw-hrs. generated... 14,912,634	Average cost price...\$0.0140
Kw-hrs. sold 11,221,933	Average cost price...\$0.0187

Net earnings	\$88,462.20
Fixed charges—depreciation and interest	55,724.73
Kw-hrs. generated... 14,912,634	Average cost price...\$0.0037
Kw-hrs. sold 11,221,933	Average cost price...\$0.0049

Profit for year of 1914	\$32,737.47
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OPERATION

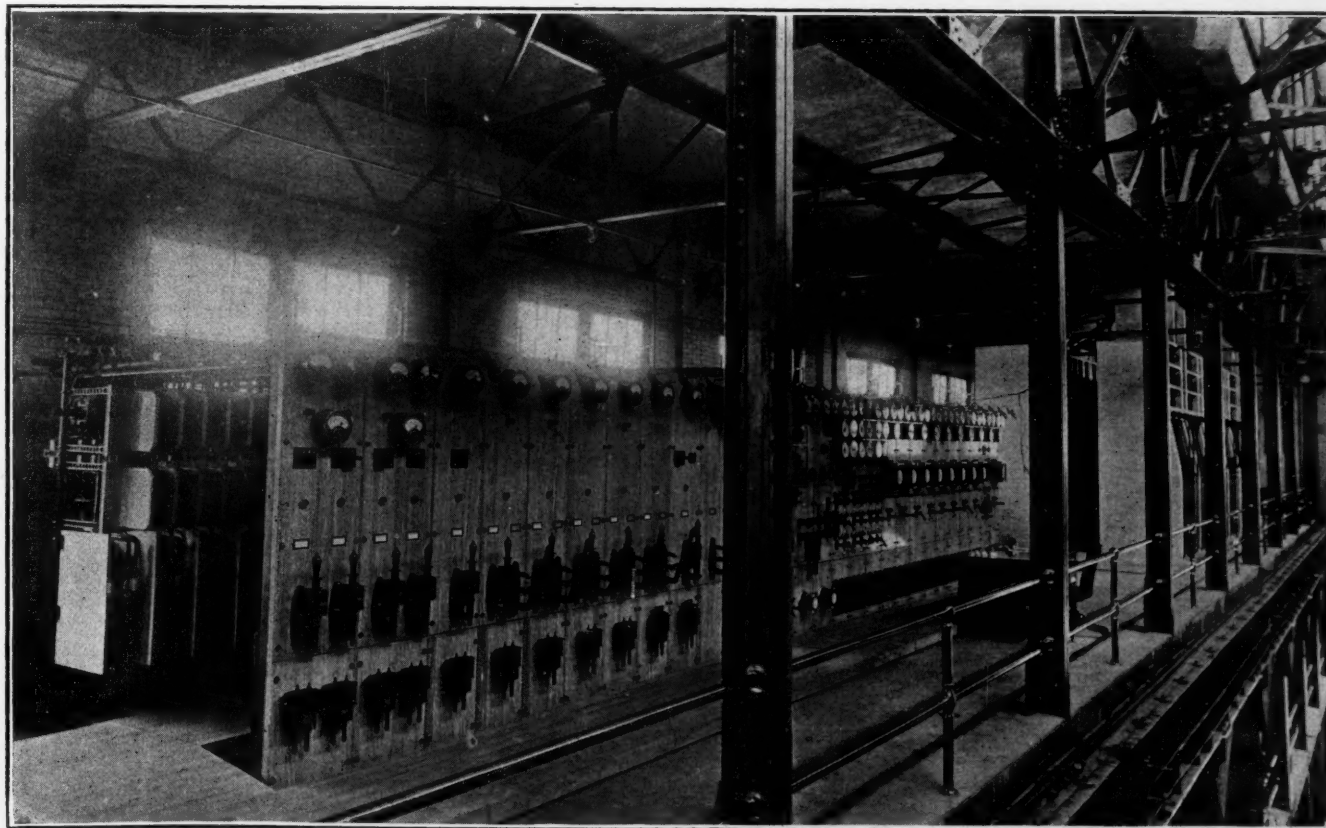
The growth of the business of the municipal lighting plant is very clearly shown by the accompanying table, which gives a condensed revenue and expense statement for 1912, 1913 and 1914.

On May 1st, 1914, the price of current was reduced from a maximum of 8 cents per k.w.h. to a maximum not to exceed 3 cents per k.w.h., and a minimum of one cent. Receipts dropped 28 per cent, the loss in revenue not being in proportion to the cut in the maximum as a great deal of business was being done with large customers, whose rates remained practically unchanged. It was interesting to note the stimulation in business of the plant, following the cut, and in a few months all the revenue lost had been recovered.

Distribution System—Operation and Maintenance for Years 1912-1913-1914.

	1912	1913	1914
Poles and Lines.....	\$ 7,342.53	\$ 8,203.32	\$11,420.74
Arc Lamps	2,241.68	4,845.53	7,868.73
Meters	334.12	486.68	1,695.83
Stable, Shoeing, Harness.....	582.16	760.28	1,178.75
Feed and Bedding.....	1,134.86	1,935.57	3,377.98
Motor Vehicles		923.61	4,122.05
Carbons and Globes.....	2,219.08	2,735.80	3,126.83
Trimming Labor	2,811.25	2,437.48	3,167.10
Services, Transformers, etc. ..	3,224.87	6,166.62	11,470.61
Mtce. Ornamental Poles.....			630.28
Mtce. St. Arc Lt. Equipment..			130.04
Miscellaneous Supplies	573.40	1,084.94	147.70
Tools	197.25	213.69	
Substation Mtce.		2,054.98	5,499.35
	\$20,661.20	\$31,848.50	\$53,835.99
Kw.-hrs. generated	4,611,853	7,797,661	14,912,634
Cost per kw.-hr. generated....	\$ 0.00448	\$ 0.00408	\$ 0.00361

The following table shows the results of operation of the East 43rd street station from July to December 31st, 1914.



MAIN SWITCHBOARD GALLERY, 53D STREET STATION.

East 53d Street Power Plant Report.
July to December 31, 1914.

	Unit Cost
1 Boiler and Engine Rm. Service.....	\$ 8,580.48 \$0.00148
3 Lubricants	144.68
4 Pack. and Waste.....	36.46
5 Water	471.60
6 Switchboard Attendance	1,722.60
7 Tools	5.49
8 Miscellaneous Supplies	41.46
9 Cleaning and Toilet Supplies.....	18.71
Total Sundries	\$ 2,441.20 .00042
2 Mtce. Grounds	65.43
4 Mtce. Boilers and Settings.....	146.05
6 Mtce. Coal and Ash Handling.....	624.08
7 Mtce. Condsg. Mchry. and Piping..	66.37
8 Mtce. Aux. and Miscellaneous Mchry.	89.48
9 Mtce. Engines and Prime Movers...	22.08
10 Mtce. Generators	138.67
11 Mtce. Switchboard	18.13
12 Mtce. Spec. Instruments.....	20.37
Total Maintenance	\$ 1,190.66 .00020
Fuel used—weight	8,505.47 T. 2.935 lbs.
Cost per ton.....	\$ 1.78
Amount	15,139.74 .0026
Total generating service expense.....	\$27,352.08 .0047
Tqtl kw.-hrs. at switchboard.....	5,794,700

The results attained, therefore, for the first five months of operation exceeded slightly the expectations and plans of the engineers. According to the schedule laid out on page —, the allowable station charges were \$0.005. The cost of generation and distribution for the latter part of 1914 was \$0.014, compared with \$0.0167 in 1912 and \$0.0149 in 1913. For the first two months of 1915 the price has been lowered to \$0.0128 and it is expected that even this figure will be bettered during the year. The cost of generating power, which is the largest item to be reckoned with in the operation of a lighting plant, is the one on which a gain is expected through increased economy. For the first two months of 1915, this cost has been lowered to \$0.0037, compared with \$0.0047 in 1914 and \$0.0097 for 1913 operation of the Brooklyn plant.

The revenue and expense statement of the plant for the four months, January 1st to April 30th, 1915, is as shown in the tables in the next column:

The total revenue during the first four months of 1915 was \$150,343.82. The total costs for operation and maintenance, including administration and overhead charges but not interest and depreciation, was \$93,916.60. The net receipts therefore during these four months was \$56,427.32 or approximately 36 per cent of the gross receipts. The average profit during this period was at the rate of about \$170,000 per year for net receipts. However, the revenue is increasing very rapidly every month and the net receipts for May were approximately \$18,000, so that the plant is now running at the rate of over \$200,000 per year for net receipts. At the present rate of increase the total receipts for the year 1915 will be approximately \$600,000, and the net receipts will be approximately \$300,000. Commissioner Ballard believes that at the end of this year the plant will be loaded up to one-half its ultimate capacity. The Sinking Fund Commission of the city, in a statement carried up to the first of July, shows that the entire indebtedness for the municipal lighting plants is \$2,770,000 and that the total amount due annually from plant to the Sinking Fund Commission to cover the interest on these bonds is \$120,660. But the Department of Public Utilities is not only arranging to take care of all the interest payments from the revenue of the station but has already started out to establish a fund from these revenues sufficient to redeem all bonds at maturity. The amount necessary for this accomplishment is shown on the sinking fund statement to be \$20,031.46 semi-annually. This, however, does not include the two issues of \$500,000 on March 20th, 1915, and of \$200,000 on April 14, 1915, which are installment bonds maturing at the rate of \$20,000 and \$8,000 respectively each year be-

Revenue and Expense Statement.
January 1, 1915, to April 30, 1915.

Revenue—	
From sale of current	\$148,234.41
From sale of steam	1,785.16
From miscellaneous sales	5.71
Interest earnings	831.08
	\$150,856.36
Less allowances for overcharges.....	512.54
	\$150,343.82
Production—	
Operation	\$37,342.58
Maintenance	2,551.52
	\$39,894.10
Transmission—	
Operation	4,469.88
Maintenance	21,390.61
	25,860.49
Utilization—	
Operation	3,025.34
Maintenance	5,520.47
	8,545.81
Total operation and maintenance..	74,300.40
Reserve for depreciation	16,576.54
Deferred upkeep (profit and loss)..	4,000.00
Administration—	
Supervision and eng'g.	4,125.40
Office payroll	8,659.11
Furniture (mtce.)	21.03
Stationery and supplies	1,309.63
Office incidentals	341.90
Damages	58.00
Telephone & telegraph..	483.94
Transportation	303.60
Advertising	268.71
Dr. of public utilities..	1,375.83
Rent	204.00
	17,151.15
Interest account	19,616.10
Profit from Jan. 1 to April 30, 1915..	18,699.63
	\$150,343.82 \$150,343.82

Report of State Examiner on Municipal Electric Light Plant, April 30, 1915.

	Assets	Liabilities
Tangible property (land).....	\$139,566.24	
Structures used in electrical operations	440,176.04	
Equipment used in electrical operations	706,195.57	
Transmission (distribution)	1,270,120.45	
Construction expense	70,684.41	
Interest during construction.....	111,366.74	
Sinking fund investment	111,883.27	
Current and nominal assets.....	906,413.26	
Property used in other than electrical operation	9,842.49	
Fuel inventory	3,317.98	
Sale of scrap.....		\$1,819.12
Meter deposits		4,389.00
Bonded debt		2,770,000.00
Sinking fund liabilities		120,371.58
Accrued interest		13,382.20
Sinking fund reserves		91,851.81
Accounts payable		11,768.82
Vouchers payable		68,641.05
Deferred upkeep		3,752.00
Water works dept. (accounts payable).....		162,525.54
Old surplus		502,365.70
New surplus (profit for 4 months).....		18,699.63
	\$3,769,566.45	\$3,769,566.45

ginning December 1, 1915. Including this \$28,000 annually and the amount necessary for the redemption fund of the balance of the bonds gives the total annual payments to the Sinking Fund Commission of \$68,062.92. This, with the interest on the bonds, gives a total amount for the fixed charges on the present investment of \$188,722.92. But the plant is operating with net receipts averaging approximately \$200,000 per year, and it is believed that by the end of 1915 the net receipts will be approximately \$300,000.

The commissioner and chief engineer of the Division of Light and Heat is F. W. Ballard, to whom we are indebted for the above information. Charles W. Stage is the director of the Department of Public Utilities.

ORNAMENTAL LIGHTING AT THE PANAMA-PACIFIC EXPOSITION.

The illumination of the Panama-Pacific exposition grounds is believed to exceed all previous efforts of the kind in magnitude and in character of illuminating effects. The plan was worked out scientifically and use made of the most modern lamps and ideas to accomplish the results desired. The general lighting scheme was designed by W. D'Arcy Ryan, chief of illumination, illuminating engineer of the General Electric Company.

From the beginning the idea was to have the lighting arranged so as to give one walking through the avenues the impression of being in a theater; the buildings, shrubbery, flowers and trees representing the stage, and there is no detail of architecture that cannot be seen with equal enjoyment by night as well as by day. The true colors of the flowers and trees surrounding the buildings are brought out by the clear white light of the ornamental luminous arc lamp, as well as the beautiful soft tints and delicate shades that were selected by Jules Guerin, chief of color, for the building exteriors. For interiors, thousands of Mazda lamps furnish the light, which shines through colored panes of glass and gives the buildings the cheerful appearance of being inhabited. Mazda lamps also produce practically all the exterior lighting in the grand courts among the exhibit palaces, and the interior and exterior lighting of the amusement zone. All the towers are illuminated by searchlights or projectors, concealed on the roofs of the surrounding buildings. Searchlights are likewise the source of light in the scintillator, which floods the sky over the Exposition with light of varying color thrown on clouds of smoke and jets of steam.

The nine main exhibit palaces, in addition to Festival Hall, Horticultural Palace and the Service building, have their outer walls illuminated by ornamental luminous arc lamps. The lamps are concealed behind translucent banners of artistic heraldic design and plaster shields. The banners are placed partly around the lamps and are of such a density as to allow just enough

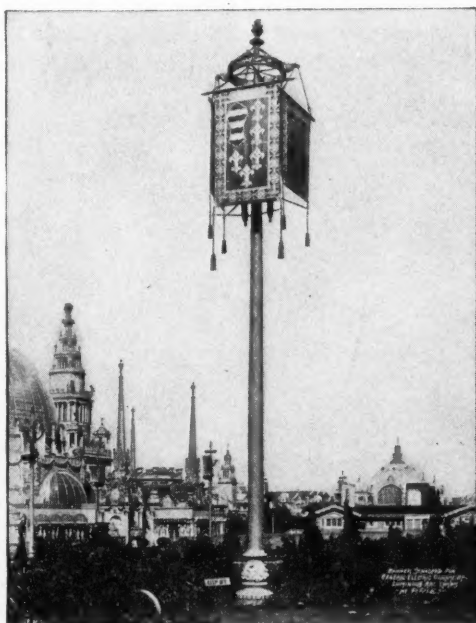


PALACE OF MACHINERY SHOWING EXTERIOR ILLUMINATED BY ORNAMENTAL LUMINOUS ARC LAMPS.

light to pass through to show their designs and colors, while the greatest flood of light is reflected directly against the walls of the buildings.

Instead of being mounted on single-lamp standards, the ornamental luminous arc lamps are grouped. Different standards have two, three, five, seven and nine lamps each. These standards, of artistic design, are of different heights, from 25 to 50 feet, to correspond to the height of the walls of the buildings they are lighting. The spacing of the standards ranges from 50 to 65 feet, in conformity with the area lighted and intensity desired. Solid wooden poles support the framework or cross-arm on which the lamps rest. A groove is cut in the side of each post for imbedding the cable, after which the opening is closed by strips of wood. About 900 lamps are in operation at the present time, each circuit containing approximately seventy-five lamps.

The Band Concourse, an open-air resting place where daily band concerts are given, is also lighted by ornamental luminous arc lamps, with leaded glass shades surrounding the globes. There are five lamps to each post, four at one level and the fifth in the center a little higher up. These standards are of attractive design and make as fine an appearance in the daytime as at night. A large freight yard contains eight more of these five-lamp standards, without the leaded glass shades; these



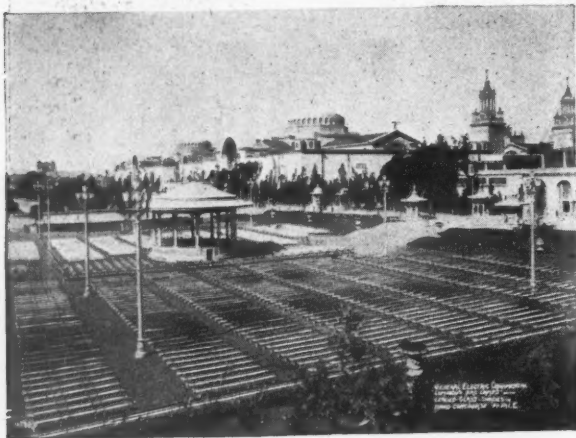
FRONT VIEW OF BANNER STANDARD WITH ORNAMENTAL LUMINOUS ARC LAMPS.



REAR VIEW OF BANNER STANDARD WITH ORNAMENTAL LUMINOUS ARC LAMPS.

lamps burning all night and aiding very much in unloading cars.

The lighting of the exposition grounds demonstrates that grouping lamps is of great advantage for accom-



BAND CONCOURSE SHOWING ORNAMENTAL LUMINOUS ARC LAMPS WITH LEADED GLASS SHADES.

plishing certain illuminating results. There are places in many cities where this arrangement could be used effectively. On streets or sections of streets that are exceptionally wide—say 100 feet or more—two-lamp or three-lamp posts can be used to better advantage than single-lamp posts placed so as to try to secure adequate illumination. Often public buildings are set back from the curbing a considerable distance, and one or two extra lamps on posts in such localities will bring out the buildings with the desired prominence. At street corners or in parks there are a great many instances where as many as five-lamp standards should be recommended.

DANVILLE'S MUNICIPAL POWER PLANT

Has Been Operated for Thirty Years—New Plant of Seventeen Hundred Kilowatt Capacity Described—Municipal Gas Plant

Danville, Va., claims to have been the first municipality in the United States to own and operate its electric street lighting system, having begun this in 1885. No commercial lighting was done, however, until in 1900 superintendent C. A. Ballou (since deceased) persuaded the council to enter this field and install a small equipment for lighting business houses and residences. Each year since then has shown a revenue increase of more than 25 per cent over its predecessor, and in 1907 the superintendent pointed out the necessity of enlarging the plant to meet the rapidly increasing demands. At an election held on July 11, 1911, the voters authorized issuing \$150,000 in bonds for improving the electric property, the vote being 1,005 to 32. The Scofield Engineering Company, of Philadelphia, was employed to prepare plans for the plant and supervise its construction. L. R. Woodhull, of New York was engineer in charge of erection of both plant and equipment. This plant has now been in operation for two years. The superintendent and secretary-treasurer of the municipal water, gas and electric light and power departments is Frank Talbott.

The new plant is located on Dan River on a plot 259 by 320 feet, in the very center of the population to be served. A railroad siding delivers coal directly at the plant, while an abundant supply of water for all purposes is secured by gravity from Dan River. The building is

of brick, 100 feet long by 90 feet wide. The stack is of reinforced concrete, 190 feet high and with an inside diameter of 9 feet at the top and 14 feet at the bottom, the bottom 90 feet being lined with brick.

Coal is dumped from an elevated siding upon a concrete floor in front of the boiler room, whence it is hauled into the boiler room in coal wagons holding about 1,200 pounds each. Each wagon load is weighed on platform scales set in the boiler room floor, and a careful record is kept of the amount of coal burned from day to day.

The boiler plant consists of four Babcock & Wilcox boilers of 350 horse-power each, set in two batteries, there being space in the boiler room for one additional battery of the same size. The normal steam pressure is 190 pounds per square inch, with 150 degrees superheat. The boilers are hand-fired with stationary grates, and ash hoppers are provided underneath the grates, which discharge the ashes into a small car running on a track in the basement. This car is then lifted to the main floor by means of an electric elevator, Westbrook make.

The generating equipment consists of two 600-KW. 80 per cent P. F. 2,300-volt alternating current generators, each direct connected to a Curtis turbine, and one 500 K. W. generator direct connected to an Allis-Chalmers turbine, both types operating at a speed of 3,600 revolutions per minute. The latter unit formed a part of the equipment of the old station, and was removed from there to the new plant. These units are provided with surface condensing apparatus made by the C. H. Wheeler Manufacturing Company. There are three condensers so arranged that each unit can be used with the condenser on either side. The air pumps are of the Mullen type, 6x14x10 inches in size, running at 70 revolutions per minute, and the circulating pumps are of the centrifugal type, with 8-inch discharge, direct connected to 5x5-inch vertical engines running at 300 revolutions per minute. Condensing water is taken from the river by means of a 36-inch pipe carried underneath the building foundations and out to an intake crib 125 feet from the river bank, and is discharged into the river through a similar pipe terminating at the river bank. The condensed steam from the condenser is discharged into a concrete tank, and thence by means of a 6x10-inch service pump is lifted to the feed water heater located on the main floor. From this heater it is fed into the boilers by means of an 8x5x10-inch plunger pump. Both boiler feed and service pumps are in duplicate and were made by the Warren Steam Pump Company. Both are automatically controlled by Schade pump governors. When the quantity of condensed steam is not sufficient, make-up water is admitted to the hot well through a float-controlled valve, either from the city system or from the river by means of one of the two service pumps. A meter is provided in the pipe line between the boiler feed pumps and the boilers which, by means of recording apparatus located on the main floor, keeps a record of the quantity of water fed to the boilers. This record and the record of the coal burned together show the efficiency being obtained from the boiler plant.

Excitation for the main units is provided by two turbine driven exciters of 35-K. W. capacity, running at 3,600 revolutions per minute, and a motor driven exciter of 15 K. W. capacity. A 100 K. W. rotary converter furnishes 500-volt direct current for a few motor customers. The electric energy generated is controlled by a switchboard consisting of twenty-five panels. The current from sets of bus-bars through oil switches located in a bus the main generators is carried to either of two duplicate room underneath the main floor, the oil switches being

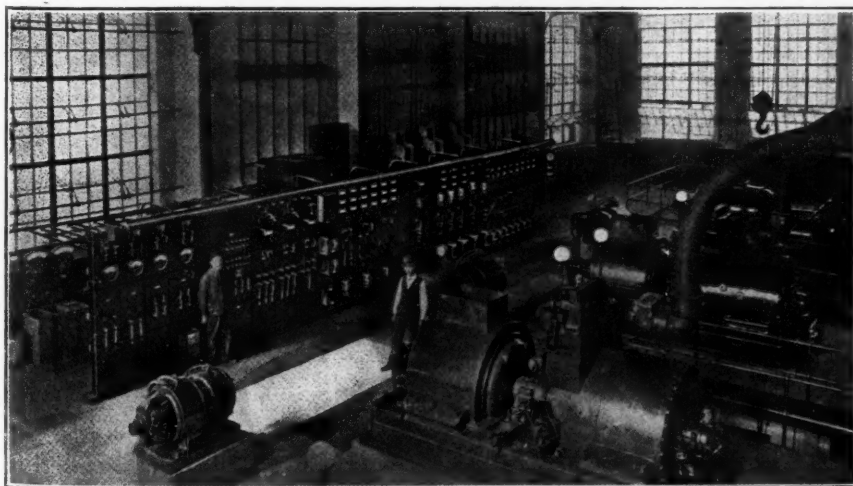
operated from the switchboard by means of a system of rods and bell cranks. From these bus-bars the energy is distributed to three feeders for general light and power service, to the rotary converter and motor driven exciter, and to the street lighting apparatus, which also is located in the bus room. This last consisted of two mercury arc rectifiers of the latest design and of four constant-current transformers which formed a part of the equipment in the old station. All this apparatus is controlled by oil switches, each oil switch being provided with a relay which causes it to open automatically in case of over-load.

Provision is made in the building for adding a 1,500-K. W. generating set to the present equipment and also for substituting a similar unit for the Allis-Chalmers turbine. The switch board is designed to control this apparatus, blank panels being provided where necessary, and the apparatus made of sufficient size for the increased capacity. The electrical equipment, with the exception of a part of that brought from the old station, was made by the General Electric Company.

The lines are carried over the switch board and through conduits in the roof of an annex on the front of the building, thence by means of two steel towers to Bridge street. In this annex are located the chief engineer's office, a room for meter and arc lamp testing, and toilet, shower and locker room for the employees.

The total cost of the plant was as follows:

Land	\$18,110.00
Building and machinery foundations.....	20,844.97
Building superstructure.....	29,394.03
Furnaces and boilers.....	33,660.04
Feedwater heater	1,140.00
Condensers	11,479.05
Pumps	1,301.13
Valves	6,418.83
Piping	16,049.43
Other steam equipment.....	963.51
Turbines	25,265.25
Electric equipment:	
Switchboard	19,340.33
Other equipment.....	4,411.46
Intake and discharge line.....	14,138.74
Spur track	8,766.89
Miscellaneous station equipment.....	2,098.80
Miscellaneous charges	3,078.04
Interest	1,055.57
Bond issue costs.....	1,229.23
Engineering	10,168.04
Total cost	\$228,913.34



INTERIOR OF DANVILLE MUNICIPAL POWER HOUSE.

Danville is one of the few cities in the country operating a municipal gas plant, which plant is ten years older than the electric one. Each year shows an increase in the use of gas, especially for heating and cooking. A

200,000 cubic foot holder was added to the plant last year, more than doubling the storage capacity. There are about 2,000 condensers, using about 75 million cubic feet of gas a year. Gas is sold at one dollar less 10 per cent for prompt payment.

MODERN STREET ILLUMINATION*

Development of Arc and Incandescent Lamps—Comparative Efficiencies and Other Advantages—Reflectors and Shades—Planning Street Lighting Systems.

A vast improvement in quality and quantity of the street illumination obtainable for a fixed expenditure is sure to result from the recent advances in lamp manufacture and the development of scientific reflecting devices which permit a better utilization of the light produced; in which respects 1914 was the year of the greatest progress in street lighting since Dr. Charles Brush exhibited his first carbon arc lamp.

ARC LAMPS.

The first arc lamp installation was made on the public square of Cleveland in 1874, and the open arc remained the standard street illuminant of the world for years. The enclosed arc came on the market in 1894, and was followed by the magnetite or luminous arc and the flame arc lamps. The first successful incandescent lamps were made by Edison in 1879, and the carbon filament lamp remained the standard until 1904, when the Gem lamp was introduced, followed by the tantalum lamp in 1905, neither of which was widely adopted for outdoor work. In 1909 the tungsten filament lamp began rapidly to displace the carbon lamp for street lighting; and the vacuum tungsten in 1914 began to yield leading place to the "Nitrogen filled" (Mazda C) lamp.

The principal advantage of the open arc was its high efficiency—with an energy consumption of less than 500 watts, the lamp furnished a maximum intensity of about 1,200 candlepower. The chief disadvantage was poor light distribution; a black shadow was thrown immediately under the lamp and most of the light was thrown at an angle of 45 degrees with the horizontal, whereas the most valuable light for street surface illumination is that thrown 10 degrees below the horizontal. At 10 degrees the open arc of nominal 2,000 candlepower gave only about 300 candlepower. (The nominal 2,000 candlepower lamp seldom exceeded 1,200 candlepower in maximum intensity at any angle.)

The enclosed arc lamp in its improved form required 75 volts in place of 50 for the open arc, and to reduce the power to equal that required for the open arc, the amperage was made 6.6 instead of 9.6. In a number of legal controversies it has been decided that the 7.5 amp. A. C. enclosed arc is the equivalent of the standard open arc. This does not even approach in candlepower the maximum intensity of the open arc, but at 10 degrees below the horizontal it slightly exceeds the open arc. The light also is more steady. The small inner globe about the electrodes causes a much slower consumption of the carbons, requiring about one trimming in five to seven days, instead of nightly, which reduces the cost of operating. The fact that the enclosed arcs could be

*Abstract of a paper before the Cleveland Engineering Society by Ward Harrison, illuminating engineer of the National Lamp Works of the G. E. Co

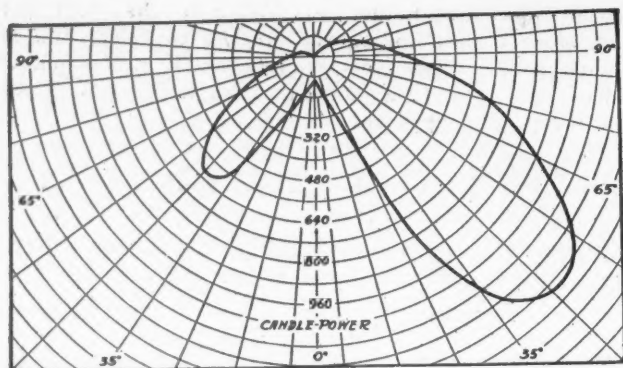


FIG. 1.—CANDLE-POWER DISTRIBUTION CURVE OF 9.6-AMPERE OPEN ARC.

operated successfully on alternating current hastened their introduction because of the greater convenience in generation and transmission of power.

In the luminous arc or magnetite arc lamp one (usually the upper) electrode is of copper and the other of magnetic oxide of iron. In this lamp it is not the electrodes themselves which are the principal light sources, but a very large percentage of the light comes from the arc stream, which becomes luminescent from the material carried into it from the negative electrode. The 4 amp. magnetite lamp (the most popular size) consumes less power than either open or enclosed carbon arcs, but the installation cost is much higher because they require

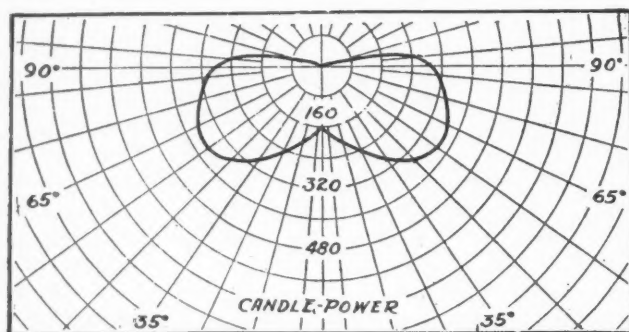


FIG. 2.—CANDLE-POWER DISTRIBUTION CURVE OF 7.5-AMPERE A. C. ENCLOSED ARC.

direct current, while alternating current is generally used for street lighting. The mercury rectifier set necessary for obtaining direct current from alternating adds materially to the initial investment. This lamp furnishes 650 to 725 candlepower at 10 degrees below the horizontal, which is easily double that given by the open or enclosed carbon arc lamps at this angle. (Still higher efficiencies may be obtained, but with a somewhat shorter life.) It is also superior in steadiness.

The flame arc operates in somewhat the same manner

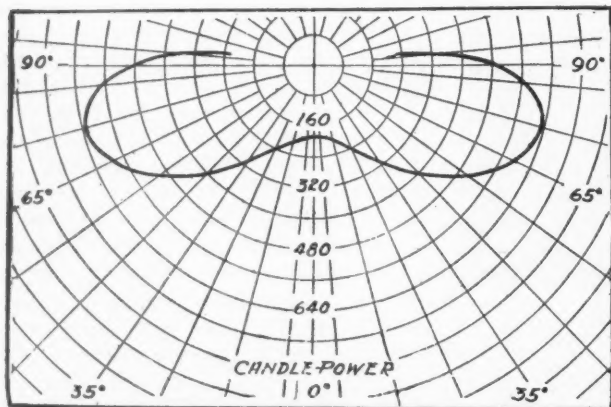


FIG. 3.—CANDLE-POWER DISTRIBUTION CURVE OF 4-AMPERE MAGNETITE ARC LAMP.

as the magnetite, the distinction being that in the former the luminescence of the arc depends upon the evaporation of salts contained in the electrodes, the vapors becoming luminous in the high temperature of the arc. Carbon is one of the basic constituents of the electrodes and hence the open flame arc must be trimmed daily like the old open arc. The carbons of the flame arcs may be enclosed, thus increasing the life of the electrodes, in which case a means must be employed for depositing the smoke and fumes from the burnt material of the arc at some place where they will not interfere with the light.

INCANDESCENT LAMPS.

Even greater has been the progress with the incandescent lamp, as indicated in the diagram Fig. 4. For purpose of comparison, a series lamp of 65 watts has been used as the basis for this diagram. Curve A represents the distribution of light from the carbon filament lamp. This was rated as 16 candlepower; at angles near the horizontal, 10 to 20 candlepower could be secured by the use of a proper reflector. Curve B represents the tungsten filament lamp, which gives a maximum intensity of 50 candlepower, which can be increased to 65 candlepower, by means of a well designed reflector, or three times as much as the carbon filament. By using inert gas in the bulb in place of a vacuum the efficiency is again increased twofold, giving 100 candlepower in the horizontal direction from a bare lamp. This

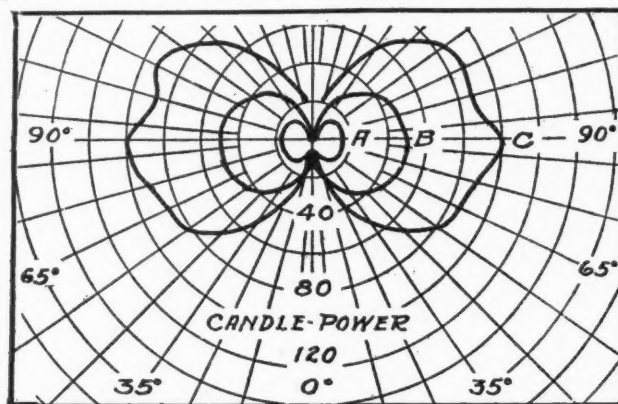


FIG. 4.—INCREASE IN LIGHT FROM 65-WATT INCANDESCENT LAMP, 1885 TO 1914.

was the first incandescent lamp to equal the enclosed arc in efficiency.

All materials used for filament disintegrate and vaporize rapidly when their normal operating temperatures are greatly exceeded, and the efficiency of a vacuum lamp is dependent only on the practical operating temperature of the filament. Tungsten owes its superiority over carbon and other materials for incandescent lamp filaments largely to the high temperature at which it may be operated without rapid vaporization. In the vaporization of a lamp filament, the material is deposited directly on the lamp bulb, causing a loss of light through absorption. This loss is largely neutralized in vacuum tungsten lamps by the use of chemicals which form colorless compounds with the deposit.

Oxidation rapidly destroys a filament, and to prevent this the earliest lamps were filled with nitrogen or some other inert gas. But this, though it prevented oxidation, did not decrease the conduction of heat from the filament; and it was because creating a vacuum in the bulb both eliminated destruction by oxidation and decreased heat losses very greatly, thus improving efficiency, that vacuum lamps were used. But investigation showed that vaporization of an incandescent filament at a given temperature increases as the pressure in the bulb decreases. To minimize the heat loss while retaining the advantage of atmospheric pressure in the

so-called nitrogen-filled lamp (where an inert gas is introduced into the bulb at atmospheric pressure), the ductile tungsten filament is coiled into a small helix, the 7-inch filament of the old vacuum lamp being thus compressed into a half-inch length, which is found to reduce the heat losses to a small fraction of what they otherwise are.

These new lamps are available in sizes up to 1,000 candlepower and are rapidly replacing open and enclosed arcs. In most cases it has been possible to use the old regulating equipment for the new Mazda lamps and, since the lines are already in place, the only outlay required is that for the purchase of the comparatively inexpensive units.

REFLECTORS AND SHADES.

The direction and nature of the illumination can be considerably modified by the use of reflectors and shades. Nearly all of these are based on the assumption that the light source is a point, which is approximately true for the arc light, is far from being so for the old straight filament, but which is approximated by the coiled filament. The prismatic refractor for incandescent street lighting units consists of two clear glass bowls fitted one over the other and closely joined so as to make a weatherproof union. The inner bowl is girdled on its outer surface by horizontal prisms. The outside bowl carries a series of vertical prisms on its inner surface. When the unit is assembled, therefore, the prismatic surfaces of the two parts are facing each other and enclosed in a chamber, so that no dust can collect in the prisms and the exposed surfaces, being smooth, are easily kept clean. By the inner bowl the rays are so refracted that the greater part of the light is given off at approximately 10 degrees below the horizontal; while the outer bowl diffuses the light, causing the entire bowl to appear luminous and eliminating the glare of a small brilliant light source. This refractor is recognized as the most effective accessory yet developed for street lighting, doubling the intensity of light at the useful angles over that delivered by the bare lamp. The gas-filled lamp with a refractor therefore has four times the illuminating value of the vacuum tungsten or more than ten times that of the old carbon filament lamps.



FIG. 5.—HIGH CANDLE-POWER INCANDESCENT REFRACTOR UNIT.

But in spite of the great progress made in illuminants, no substantial reduction in the annual appropriation required for street illumination can be expected. The cost of street lighting is at the present time made up largely of interest, depreciation and other capital charges on central station equipment and distributing systems. These items are not reduced by an increased efficiency or lower wattage consumption of the units. The growing necessity for more carefully built overhead systems or the expensive underground construction further tends to destroy any hope of reduction in these fixed charges.

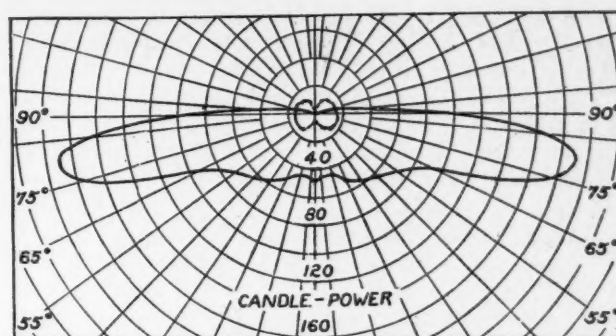


FIG. 6.—DISTRIBUTION CURVE OF 100-CANDLE-POWER LAMP WITH REFRACTOR.

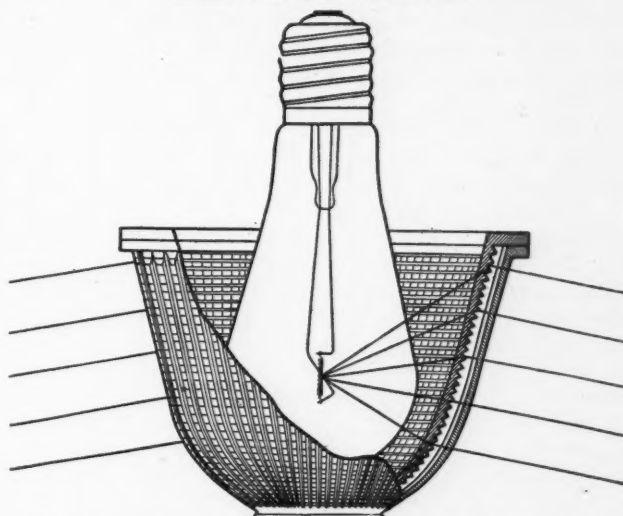


FIG. 7.—PRINCIPLE OF THE PRISMATIC REFRACTOR.

But, as stated, a vast improvement in the quality and quantity of street illumination is now possible without increasing the expenditure.

PLANNING STREET LIGHTING.

In the business district a uniform distribution of light of a considerable intensity is required in order to avoid accidents and to discourage crime. From the standpoint of advertising, a good appearance as well as high intensity is essential.

The main thoroughfares, serving as arteries for the bulk of the city traffic, form the division second in importance. Here the liability of accident is as great as in the business section for, although the congestion is not so great, there is less supervision of traffic and the speed of the vehicles is in general considerably higher. These streets, generally broad and unobstructed by trees, are commonly lighted with a pendant lamp hung at each street corner and perhaps an additional unit at the center of the longer blocks.

Residence districts, the third classification, comprise a very large part of the total mileage of the city streets and the amount which can be expended per block for lighting is limited. Enough light should be distributed on these streets to discourage criminal acts and make vehicular movement safe. In many cities an arc lamp is placed at each street intersection, in many smaller towns at every second corner only; in other cases low candlepower incandescents with closer spacing are used. In lighting such streets the problem is to utilize an insufficient quantity of light to the very best advantage. Here the angle of distribution is of more importance than where the lamps are closer together. Given lamps suspended 20 feet above the road surface and 400 feet apart, and the rays of light which strike the road surface at the middle of the block are those making an angle of 6 degrees with the horizontal and the illumination is not

more than one one-thousandth of that at the street corners. If the lighting of the middle section is cared for, that at the corners will be ample.

Given a 400-foot block with a lamp at each end suspended 20 feet above the surface, and the foot-candles of horizontal illumination at the center of the block, using the various lighting units, would be as follows:

9.6 amp. D.C. open arc.....	.0015 foot candles
6.6 amp. A.C. enclosed arc.....	.0013 "
7.5 amp. A.C. enclosed arc.....	.0016 "
4 amp. magnetite arc.....	.0029 "
400 C. P. Mazda with refractor unit..	.0039 "
600 C. P. Mazda with refractor unit..	.0058 "

Uniform illumination of low intensity, such as is obtained by lamps of low candlepower placed close together, is not desirable, for, with light coming from so many directions, objects in the road would not cast heavy shadows nor have dark surfaces to silhouette against the light beyond; while if lamps of high intensity direct a considerable amount of light to the center of the blocks, objects would be distinguished not only because of the light reflected from them, but also from the shadows which they cast on the road surface. Considering all these points, it appears that lamps of moderate candlepower spaced 200 to 250 feet apart will result in the most satisfactory illumination obtainable for a given expenditure per mile. Such may be had by installing a lamp at the center of each block in addition to those now on the corners, which, if all have the same intensity as the original lamps, will give four times as great illumination as before at the darkest points and the silhouette and shadow effects will be of very much greater service. A smaller unit may suffice for the center of the block, since the illumination on the street need not be so high there as at the street intersections.

In cases of crooked streets or streets lined on each side with trees having heavy foliage, dense shadows are inevitable with lamps placed at street corners only, or even with an additional unit inserted at the middle of the block. For such residence streets, a number of small units closely spaced appears to be the only practical method for obtaining satisfactory illumination.

ORNAMENTAL LIGHTING.

When the tungsten lamp was first available, the standard ornamental system consisted of posts carrying four or five lights. These superseded the old systems of carbon incandescents looped in arches over the street. The five-light equipment has fallen into disfavor of late because in the daytime especially the posts assume too much prominence in the street. The sentiment today inclines toward a single-light post or a post having two lights at most. Ornamental lighting is at present almost entirely confined to comparatively high candlepower units either of the magnetite arc or the incandescent lamp installed 80 or 100 feet apart. At the close spacing usual in ornamental lighting installations a distribution similar to that obtained from the refractor is not of so great an advantage. It is true that in a number of small towns that have ambitions for a "White Way" we have found it desirable to confine the light to the angles below the horizontal in order to concentrate the attention of the observer toward the first story of the buildings, for most of the store buildings are really made-over houses or houses extended out to the street. The general appearance of the lower parts is good, but the choice of an illuminant which draws attention to the upper and less attractive parts of the buildings by lighting them directly would often make the effect less pleasing at night than it is in the daytime.

On the other hand, in illuminating important business streets of large cities where the buildings themselves

are worth looking at, a considerable amount of light should be directed upward so as to reveal the facades of the structures. In order to obtain a uniform effect, the candlepower should be greatest in the direction of the upper stories since they are farthest away. For this purpose there have been some developments in the nature of projectors for use on street posts. A silvered parabolic reflector is placed on top of an ordinary ornamental post so that when equipped with a high powered concentrated filament lamp it will flood-light the adjacent buildings uniformly. Up to the present time, the limitation of this system has been the difficulty of obtaining a high candlepower lamp of sufficiently small dimensions so that its appearance is not objectionable. Such a unit would, of course, be used only as an auxiliary to the larger light source on the post, which would then be called upon to direct light into the lower hemisphere only.

In so far as the illumination on the roadway is concerned, for the ornamental installations, the results would be entirely satisfactory even if no light were given out by the unit at angles higher than 20 degrees below the horizontal. In the mind of the public, however, the success of a "White Way" system depends in a large measure upon the multiplicity of bright lights in the field of vision, and for this reason installations are usually designed to direct their greatest intensity at angles near the horizontal so that the units may present an appearance of maximum brightness to the eyes of the casual observer.

MUNICIPAL POWERS RE. LIGHTING PLANTS

Court Decisions as to Powers of Municipalities to Erect and Purchase Light Plants to Provide Street and Commercial Lighting.

BY J. SIMPSON.

TO LIGHT STREETS.

The great weight of authority is to the effect that an express grant of power to a municipality by the legislature to light its streets carries by necessary implication power to construct or acquire by purchase a lighting plant for that purpose; and that express and specific legislative authorization to so construct or acquire a plant is not necessary. *Mauldin v. Greenville* (1890), 33 S. C. 1, 11 S. E. 434, 8 L. R. A. 291 (where the city was expressly given power to own property); *Hay v. Springfield* (1896), 64 Ill. App. 671, followed in *Blanchard v. Benton* (1903), 109 Ill. App. 569; *Houma Lighting & Ice Mfg. Co.* (1911), 53 So. 970; *Crawfordsville v. Braden* (1891), 130 Ind. 149, 28 N. E. 849, 14 L. R. A. 268.

One of the earlier cases in which the point is discussed is *Rushville Gas Co. v. Rushville* (1889), 121 Ind. 206, 23 N. E. 72, 6 L. R. A. 315, where a statutory provision that the common council of any city shall "have power to light the streets, alleys or other public places with the electric light, or other form of light," and contract for lighting such places, was held to be broad enough to authorize the common council to buy and operate the necessary plant and machinery. In *State v. Hiawatha* (1894), 53 Kan. 477, 36 Pac. 1119, it was held that a provision of a general statute authorizing councils to "provide for and regulate the lighting of the streets" and make contracts for the purpose, authorized a mayor and council to purchase an electric plant for lighting the streets. In *Swann v. City of Murray* (1912), 146 Ky. 148, 142 S. W. 244, it is held that authority of cities in Kentucky of the fifth class to own and maintain light and water systems is conferred by section 3637 Kentucky Statutes, which

empowers the city council "to contract for supplying the city with water and lights."

It is also held that a city having the usual powers in respect to police regulations, the preservation of the public health, and the general welfare, has authority thereunder to construct waterworks and an electric plant. *Ellenwood v. Reedsburg* (1895), 91 Wis. 134, 64 N. W. 885.

The North Carolina Supreme Court says, in *Henderson Water Co. v. Trustees* (1909), 151 N. C. 171, 65 S. E. 927: "Contrary to the decisions in the earlier cases in which this question was considered, it is now established by the later decisions that the supplying of water and lights by a city or town is a 'necessary expense,' and that this power, even in the absence of express grant, is a power necessarily and reasonably implied in its general grant of powers, and can be exercised by its governing authorities, unless expressly forbidden by the provisions of its charter. If the charter prescribes the particular mode in which the power can be exercised, that mode is exclusive, and must be followed." See also *Fawcett v. Mt. Airy* (1903), 134 N. C. 129, 45 S. E. 1029, 63 L. R. A. 870.

On the other hand, it has been held, in *Howell v. Millville* (1897), 60 N. J. L. 95, 36 Atl. 691, that the common council of a city, with charter authority to pass ordinances, among other things, for "lighting the streets" of the city, but without express authority to the corporation to take and hold real estate, had no implied power to erect and maintain a plant for lighting the streets, although the power to light the streets might imply power to make contracts with other persons or corporations to furnish light. And in *Spaulding v. Peabody* (1891), 153 Mass. 129, 26 N. E. 421, 10 L. R. A. 397, holding that the existing Massachusetts statutes gave cities and towns no authority to erect and maintain electric lighting plants, it would appear that express statutory authority to do so was considered necessary.

TO SUPPLY PRIVATE CONSUMERS.

In regard to the supply of light to private consumers from a municipal light plant the cases are not harmonious, but in the later decisions there is a distinct tendency toward the doctrine that a municipality may erect or purchase a plant for such a purpose. Probably the earliest case (the court could not find an earlier) on the subject is *Mauldin v. Greenville* (1890) already cited. "The city," it said, "has the express power to own property, and it has also the implied right to light the city. Do these powers necessarily imply the right to make the city the owner of the plant and a manufacturer of electricity? It is quite certain that such power is not 'essential' to the declared objects and purposes of the corporation, for heretofore the city has been lighted by contract, without owning the gas fixtures. The purchase of the electric plant was certainly a new departure and it is to be hoped that it may not prove to be troublesome and expensive to the city. But considering that some discretion, as to the mode and manner, should be allowed to the municipality, in carrying out the conceded power to light the streets of the city, we hold that the purchase of the plant was not *ultra vires* and void, so far as it was designed to produce electricity suitable for and used in lighting the streets and public buildings of the city. But we cannot so hold as to the purchase of so much of that plant as furnished the incandescent light for use in the interior of private residences and places of business, which cannot be properly included within the power to light the streets of the city. The uncontradicted testimony was that the incandescent light is not suitable for lighting the public streets. We are therefore unable to agree with the circuit judge when he said that 'if the city, from the same plant, can provide incandescent lights to private resi-

dences and places of business for compensation, and thus make the system, in part, at least, self-sustaining, economy and good business management should sustain the transaction,' etc. As we understand it, all the powers given to the city council were for the sole and exclusive purpose of government, and not to enter into private business of any kind, outside of the scope of the city government."

In 1890, the federal circuit court held that the Iowa act of general assembly, which gave the right to cities to erect or to authorize the erection of electric plants, made no distinction between lights used for public and private purposes. "It has," the court said, "been the uniform rule that a city, in erecting gas works or water works, is not limited to furnishing gas or water for use only upon the streets and other public places of the city, but may furnish the same for private use; and the statutes of Iowa now place electric light plants in the same category." *Houston Electric Co. v. Newton* (1893), 42 Fed. 723.

The question: Is it within the constitutional power of the legislature to enact a law conferring upon a city or town within this commonwealth (Massachusetts) the power to manufacture gas or electric light for the purpose of selling the same to its own citizens? was answered by the justices of the Massachusetts Supreme Judicial Court in the affirmative. *Opinion of the Justices* (1890), 150 Mass. 592, 24 N. E. 1084, 8 L. R. A. 487, but in *Spaulding v. Peabody* (1891), 153 Mass. 129, 26 N. E. 421, 10 L. R. A. 397, it was held that the existing statutes did not confer such authority.

Under a statute giving authority to provide for lighting streets, alleys, avenues, sidewalks, parks and public grounds, and to grant power to other persons to do such lighting, it was held in *Village of Ladd v. Jones* (1895), 61 Ill. App. 584, that cities and villages had no power to furnish electric lights to the inhabitants nor to fix rates and collect for such services. This case was referred to, with the remark that this ruling had been made, though never directly, by the Supreme Court, in *Palestine v. Siler*, 225 Ill. 636 (1907).

After discussing the prior cases, the court in *Christensen v. Fremont* (1895), 45 Neb. 160, 63 N. W. 364, agreed with the ruling in *Mauldin v. Greenville supra*, and held that while the power conferred upon cities of the second class having over 5,000 inhabitants, to provide for and regulate the lighting of the streets, implied the power to erect and maintain an electric lighting system for that purpose, no power could be implied therefrom to erect or maintain a lighting system for the purpose of supplying light to private buildings. A later Nebraska case, involving an accident caused by contact with a city's light wire, is vague on this point. The court says, in respect to the city's liability: "The wires were originally placed there for commercial purposes. . . . Cities of the class of the defendant are expressly authorized by statute to erect and maintain electric lighting plants, and a municipality that lawfully engages in commercial purposes is liable to the public the same as an individual." *Todd v. City of Crete* (1907), 79 Neb. 671, 113 N. W. 172. The syllabus of the case was to the effect that: "A city of the second class of less than 5,000 inhabitants is authorized by the law of this state to operate an electric lighting plant for municipal and commercial purposes." This was affirmed, 79 Neb. 671, 115 N. W. 307. In a still later Nebraska case the court said: "There is no statute authorizing the city to build a power plant, and therefore it may be said that it would not be allowed to build a power plant as such. Neither is there any statute authorizing the city to build a combined plant. The question whether the city is violating the law and attempting an

unlawful expenditure of the taxpayers' money in building a power plant, and in building a combined light and water plant is the question most discussed by the plaintiffs. This question should be considered from two different points of views. The city is authorized, for instance, to build a light plant to furnish light for the public streets of the city, and to its inhabitants. When such a plant is built the city would probably not violate any law if it sold to the citizens power which is necessarily produced in the act of furnishing electricity for lights, and so the fact that furnishing power might be incidental to an operation of their light plant, or the fact that they intend to furnish heat from the light plant, would not necessarily be a violation of the law." *Bell v. David Ctiy* (Neb., 1913), 142 N. W. 523. The statute referred to by the court is Sec. 8704, Neb. Ann. St., 1911, providing that any city or village of the state shall have the power to establish and maintain "a heating or lighting system for such city or village," and levy a tax therefor.

In *Crawfordsville v. Braden* (1891), 130 Ind. 149, 28 N. E. 849, 14 L. R. A. 268, the court saw no good reason why a municipality having the power to light the streets "may not also, at the same time, furnish it [electricity] to the inhabitants to light their residences and places of business. To do so is, in our opinion, a legitimate exercise of the police power for the preservation of property and health." "While the authorities, on the precise question, are meagre, we think the weight of authority, as well as of reason, tends to sustain the right of the municipality, through its proper officers, acting in the exercise of a sound discretion, to furnish light as well as water to its inhabitants, not only in public places, but in their private homes and places of business."

In *Linn v. Burgess of Chambersburg* (1894), 160 Pa. 511, 25 L. R. A. 217, the Pennsylvania Court said: "The power of the legislature to authorize municipal corporations to supply gas and water for municipal purposes, and for the use and benefit of such of their inhabitants as wish to use and are willing to pay therefor at reasonable rates, has never been seriously questioned. In view of the fact that electricity is so rapidly coming into general use for illuminating streets, public and private buildings, dwellings, etc., why should there be any doubt as to the power to authorize such corporations to manufacture and supply it in like manner as artificial gas has been manufactured and supplied? It is a mistake to assume that municipal corporations should not keep abreast with the progress and improvements of the age."

In *Jacksonville Electric Light Co. v. Jacksonville* (1895), 36 Fla. 229, 18 So. 677, 30 L. R. A. 541, it was held that the fair construction of the grant in the city's charter "to provide for lighting the city by gas or other illuminating material, or in any other manner," authorized the erection and maintenance of an electric plant, not only for lighting the streets and public places of the city, but also for supplying, in connection therewith, electric light for the inhabitants in their private houses.

In *Chandler v. Seattle* (Wash. 1914), 141 Pac. 331, the court, citing the *Jacksonville* case, held that a grant of power to provide for lighting the city authorizes the erection and maintenance of an electric plant for lighting the streets, and also supplying, in connection therewith, electric light for the inhabitants of the city in their private homes.

In *Mitchell v. Negaunee* (1897), 113 Mich. 359, 71 N. W. 646, 38 L. R. A. 157, there was an express authorization not only to furnish light to the municipality, but also to the inhabitants, and this was held to be within the province of the legislature. So, in *State ex rel. Town of Canton v. Allen* (1903), 178 Mo. 555, 77 S. W. 868, it was held

that a statute granting power to cities to purchase or erect and maintain electric plants for public and private lighting is not violative of the Missouri Constitution, Art. 10, Sec. 3, requiring taxes to be uniform, or of Art. 2, Sec. 20, forbidding the taking of private property for private use, or of Art. 2, Sec. 30, providing that no person shall be deprived of property without due process of law.

The general laws of Texas incorporating cities and towns provide for lighting the streets and erecting lamp-posts therein, and regulating the lighting thereof. A city established an electric light plant in connection with its water plant. It granted a franchise to install an electric light plant to furnish the citizens with light for their private and business houses. Portions of the city were without street lights, owing to the lack of funds by the city to establish more lights. It was held that the city might still, under its statutory authority, sell any surplus electric power for private purposes, notwithstanding the franchise granted by it. *Crouch v. City of McKinney* (1907), 47 Tex. Civ. App. 54, 104 S. W. 518.

In *Overall v. Madisonville* (1907), 125 Ky. 684, 102 S. W. 278, 12 L. R. A. (N. S.) 433, it was held that a municipal corporation having authority to own a plant for lighting its streets may sell the surplus of its products to its inhabitants.

In *Keenan & Wade v. City of Trenton* (Tenn., 1914), 168 S. W. 1053, it was held that an express grant of power to a municipality to light streets carries, by implication, power to construct or acquire by purchase a lighting plant for that purpose. It was further held that the city of Trenton, under its charter authorizing the city council to pass all ordinances necessary for the proper government and general welfare of the city, etc., and Acts 1903, Chap. 551, Sec. 2, as amended by Acts 1907, Chap. 488, Sec. 1, Subdiv. 10, "to provide for lighting the streets," could purchase an electric light plant, even though it was a part of its purpose or plan in so doing to furnish electric current for private, as well as public, consumption in the production of lights.

On the other hand, in *Hyatt v. Williams* (1906), 148 Cal. 585, 84 Pac. 41, it was held that a city charter giving authority to the council to provide for and regulate the lighting of streets, avenues, and public places, and to provide for such lights as are necessary for the transaction of public business, does not authorize the city to establish a plant for furnishing light to the inhabitants generally for their private use. The court said: "The providing of light for the public purpose of lighting the public streets and public places, and such lights as are convenient for the transaction of public business, is a very small and insignificant enterprise as compared with that of supplying light to the inhabitants generally for their private use. The two objects are manifestly distinct, because of the different nature of the use to which the lights are to be devoted in the different cases. The terms of the express grant of the power to provide light for the public purposes named do not indicate any intention to give the distinct and larger power to establish a plant for furnishing light for private use to all the inhabitants of the city who may desire it, and no such intention can be imputed to the framers of the charter from the language there employed. The power to determine what are public uses and to condemn lands for such use, if given the scope here contended for, would practically give the city power to engage in any enterprise of a public nature, whether mentioned specifically in the charter or not."

The *Hyatt v. Williams* case, on account of the express language of the statute, was distinguished from, and shown not to be opposed to the foregoing cases in *Cary v. Blodgett* (1909), 10 Cal. App. 463, 102 Pac. 668, where

it was held that under Section 862 of the California municipal corporation act, empowering cities of the sixth class to acquire "works necessary or proper for supplying water for the use of such city, or the inhabitants, or for irrigating purposes therein," and "to acquire, own, and control, maintain, and operate gas and other works for light and heat," it is necessarily implied in such grant of power that, when the city has an electric light plant, it has authority to furnish the inhabitants for private use as well as the general public with electric light.

The charter of a village, which gave it authority to light its streets by electricity or otherwise was amended so as to confer authority also to furnish water, electric lights, and electric power to parties residing without the corporate limits of the village. It was held, by what seems a somewhat narrow construction, that the charter, as amended, conferred neither express nor implied power on the village to furnish its inhabitants with electric lights for private use. *Swanton v. Highgate* (1908), 81 Vt. 152, 69 Atl. 667.

In New York a statute provides that no municipality shall build and operate for other than "municipal purposes" any systems for furnishing gas or electricity for lighting purposes without a certificate of authority granted by the State Gas Commission. *Potsdam Electric Light & Power Co. v. Potsdam* (1906), 49 Misc. (N. Y.) 18, 97 N. Y. S. 190; affirmed 98 N. Y. S. 1113, 99 N. Y. S. 551, 112 App. Div. 810.

But it seems that, even where it is held that there is no statutory or implied authority to supply private consumers, a municipality in building a plant to furnish public lighting, may anticipate future legislation in this direction. Where a city was invested with power to erect an electric light distributing system of poles, wires, etc. (neither the act nor the city ordinance contemplated a generating plant) and to raise the required money by taxation or bond issue, an objection was advanced that the system was intended to supply private consumers, as well as to serve the public uses, and that for such private supply there was no statutory authority. The specifications showed that the plan was to construct for public

lighting only, but in such a way that later on private lighting might be added. The court held there was nothing illegal in this. "It may be true," it said, "that a public plant that is adaptable readily to private lighting also may be more expensive than one that is not; but, granting this, the question of so constructing the plant is one of business judgment, and it may be excellent judgment so to do in anticipation of a possible enlargement of municipal powers by legislative authority." *Livermore v. City of Millville* (N. J., 1914), 90 Atl. 380.

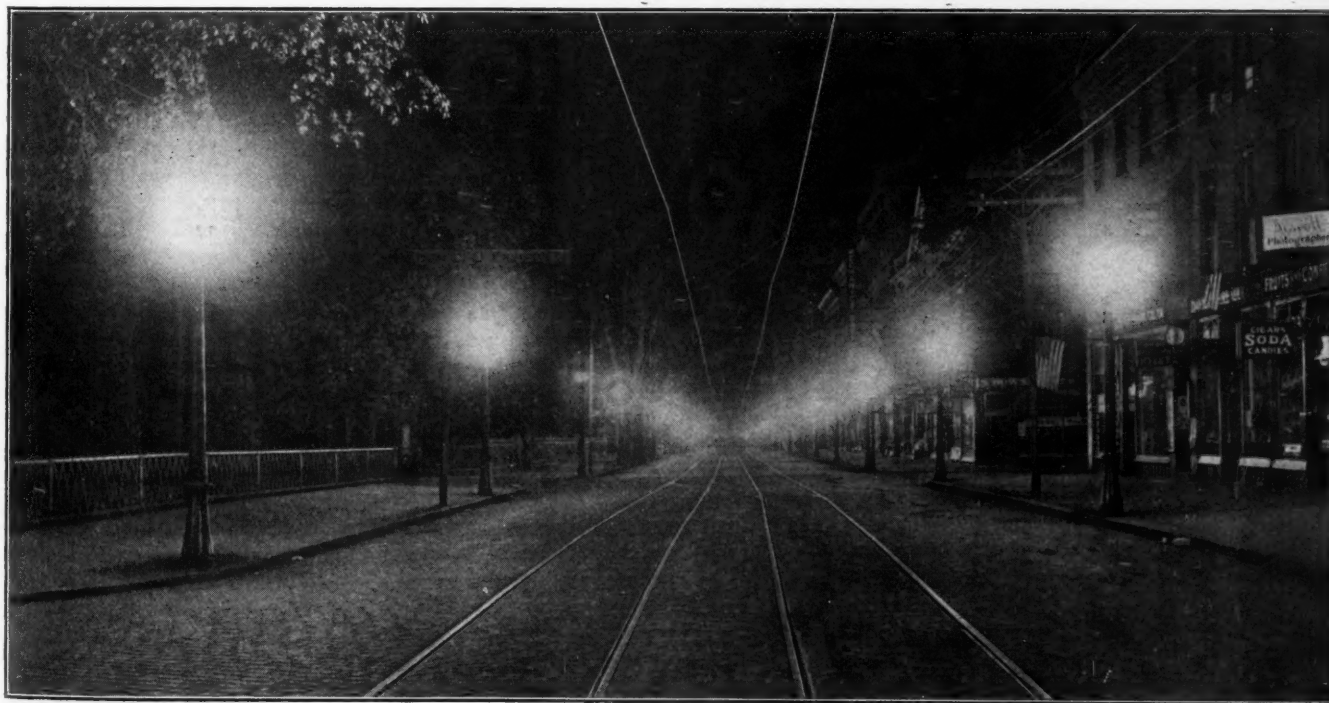
LOWELL "WHITE WAY" LIGHTING.

The city of Lowell, Mass., has put in operation an extensive system of "white way" lighting, the public opening occurring Friday evening, May 28. About two miles of streets are included in the improved illumination.

There are 234 magnetite arc lamps of 6.6 amperes capacity, which burn until midnight, and 47 arcs for all-night burning. The total yearly cost of the service is about \$16,000 per year, the lighting company owning the entire apparatus, including poles, conduits, cables, etc. The new lights replace 70 old-style arc lamps, which the city paid \$4,500 a year to light and keep in order.

The style of lamp is the General Electric ornamental inverted, giving 860 candlepower. Units are spaced closely, the minimum distance between lights being 56 feet and the maximum 120 feet, measured on the curb line. Cables are carried 18 inches under the sidewalk in 2-inch black enameled steel conduit. Posts are anchored to a concrete foundation 20 inches square and 30 inches deep. The elbows of the conduit are cast in this concrete foundation.

The height above the street of the center of the arc in the lamps is 14 feet 6 inches. At intersecting streets a lamp is located on one corner and another lamp directly opposite the cross-street if the latter does not run through. The posts are entirely of cast iron and have a cutout box in the base. The installation was made by the Lowell Electric Light Corporation's own force, the time taken being 49 days, with 150 men.



WHITE WAY LIGHTING AT LOWELL, MASS.

ELECTRIC LIGHTING DATA

Station Equipment—Amount of Current Used for Street Lighting and Other Purposes—Fuel Statistics—
Number and Kind of Lamps Used for Street Lighting—Ornamental Lighting—Rates.

The following tables give information concerning plants in all parts of the country, furnished us through the courtesy of the managers or other officials of the plants; the information having all been received within the past two weeks and being therefore right up to date.

The questions asked in obtaining the information were in most cases the same in wording as the headings of the columns in the tables. In some cases the headings are abbreviated, however, these being as follows: In Table 1, next to the last column, the question was, "Length of streets in which are overhead electric light wires"; and the last column, "Length of underground conduits containing electric light wires."

In Table 3, in asking for cost per year of both arc and incandescent lamps, it was stated that what was wished was "cost, if municipal plant; contract price, if private plant"; and the question was asked also, "What items are included in cost, or what services rendered for price, as given," and the answers to this, which are of the utmost importance in comparing costs or prices, are given in the notes below headed, "Cost of Street Lighting," which should be read in connection with the table.

In Table 5 an effort has been made to present in brief tabular form the chief elements of the rate schedule of the several cities. As hardly any two of these are exactly

(Continued on page 894)

City	BOILERS		ENGINES		DYNAMOS		STREET LINES EQUIPMENT		
	Num-ber	Total rated horse-power	Num-ber	Total rated horse-power	Num-ber	K. W. capac-ity	Total length of wire miles	Length of streets with overhead wire feet	Length of underground conduit feet
Alabama:									
Bessemer	3	900	B. & W., Heine	2	850	Hardie & Tynes, Harrisburg	2	600	Westinghouse, 75
Dothan	3	900	B. & W., Heine, Stirling	8	9,311	Wisconsin, Allis, Williams, Hamilton, G. E.	10	6,595	G. E. & W. E. 65
Mobile	9	3,451	B. & W., Heine, Stirling	8	9,311	Wisconsin, Allis, Williams, Hamilton, G. E.	10	6,595	G. E. & W. E. 595
Arkansas:									
Fort Smith	5	2,540	B. & W.	5	4,600	Fulton, Hamilton, Allis-Chalmers, Russell	5	3,450	G. E. Westinghouse, 239
Little Rock	1	350	Stirling	1	850	Curtis	1	500	G. E. 107
Paragould	4	650	O'Brien, Oil City, Wangler	6	900	St. Louis, Dela-vergne, York, Chuse	3	325	G. E. Westinghouse
Pine Bluff	6	1,800	B. & W.	3	3,000	Curtis	3	2,250	G. E. 131
California:									
Pasadena	6	9,000	B. & W., Stirling	5	8,000	Westinghouse, Hamilton	5	6,000	Allis-Chalm., 155
Riverside	3	450	Stirling	2	700	Nordberg	2	400	Westinghouse, 551
Colorado:									
Grand Junction	4	1,360	Heine	4	1,350	Corliss, Ideal, Curtis	4	950	Westinghouse 100
Montrose	3	450	Kewanee	3	450	Chuse, Ideal, Buckeye	3	300	G. E. 14
Connecticut:									
South Norwalk	4	500	.....	5	655	Busch-Sulzer, Diesel Oil	9	885	Fort Wayne, 75.6
Stamford	4	2,160	B. & W.	3	675	Bass	3b	4,500	G. E. 50,000
Wallingford	4	700	Porcupine & H. R. T.	3	750	Harrisburg, Watertown, Curtis	4	1,010	G. E. Stanley, 63
Florida:									
Jacksonville	10	5,200	B. & W.	4	12,000	Allis, G. E.	4	8,000	Allis, G. E. 4,200
Tallahassee	3	500	Scofield	3	.....	Skinner, Ball	3	500	Bullock, Stanley, Ft. Worth
Georgia:									
Dublin	4	550	Cole, Schofield	4	1,344	Skinner & Murray	4	1,087	G. E. 15
Griffin	3	250	Cole	1	350	Erie-Ball	1	240	G. E. 80
Thomasville	5	550	Scofield	2	600	Lane & Bodley	2	450	Allis-Chalmers
Illinois:									
Blue Island	4	240	Kinser	2	200	Ingersoll-Rand	..	.....	30
Canton	7	1,800	A. & T.	5	3,600	Westinghouse, G. E., Erie	5	2,400	Westinghouse, 24
Litchfield	1	200	Heine	2	400	St. Louis-Corliss	2	150	Warren 20
Urbana	2	800	Heine	1	750	Corliss	1	375	Westinghouse 91.36
Indiana:									
Anderson	6	.....	B. & W.	..	.....	.....	3	5,000	Westinghouse, ..
Bloomington	4	500	Stirling	2b	475	Allis-Chalmers	..	.....	178
Crawfordsville	3	1,050	Stirling	2	650	G. E., Curtis	2	500	G. E. 54
Frankfort	4	1,300	Stirling	2	1,500	Allis-Chalmers, Westinghouse	2	1,000	Allis-Chalm., 67
Linton	3	450	C. & T.	2	500	Allis-Chalmers	..	.....	6
Madison	2	550	Bow, Climax	4	1,750	Buckeye, Curtis	4	1,040	Crocker-Wheeler, 80
Marion	2	500	.....	..	.....	.....	..	.....	54
New Castle	2	500	Heine	1	400	Allis-Chalmers	2	150	Brush 23
Peru	3	900	Scotch Marine	2	1,200	Hamilton-Corliss	2	700	Ft. Wayne 145
Portland	3	600	Ames, Stirling	3	1,800	Ames, Hamilton	3	820	Ft. Wayne ..
Richmond	6	2,122	Stirling	3	1,700d	.....	1	500	Westinghouse 760
Valparaiso	..	.....	.....	..	.....	.....	..	.....	150a

For footnotes, see page 886.

City	BOILERS		ENGINES		DYNAMOS			STREET LINES EQUIPMENT				
	Num-ber	Total rated horse-power	Make	Num-ber	Total rated horse-power	Make	Num-ber	K. W. capac-ity	Make	Total length of wire miles	Length of streets with over-head wire feet	Length of streets of underground conduit feet
Iowa:												
Cedar Falls	4	525	Murray	2	750	Murray	2	500	Ft. Wayne	..	35a	..
Webster City	3	450	Kewanee Murray	2	750	Murray	2	500	Westinghouse	..	25a	8,000
Kansas:												
Coffeyville	5	750	Kewanee	2g 1g	850 425	Ham, Corliss, Kerr	3	900	Westinghouse, Allis-Chalmers	..	..	..
Ottawa	4	440	Brownell	3	405	Russell, Bates, Otto f.	3	325	Westinghouse	100	..	..
Topeka	3	450	Bromich	1	550	Murray-Corliss	1	500c	Westinghouse	90	52a	5a
Wichita	6	3,336	Band W.	3g	8,750d	G. E., Curtis	3	8,750	G. E.	750	153a	27,773
Kentucky:												
Henderson	3	1,200	Stirling	3	2,800	.....	2b	1,800	Westinghouse	..	..	..
Lexington	5	2,500	B. & W., Edgemore	..	.....	.....	2b	5,000	G. E.	..	..	..
Louisiana:												
Alexandria	4	888	Erie City	3 turbines	.....	.....	3	1,850	Allis-Chalmers, Westinghouse	12½	64,880	2,000
New Iberia	4	600	Tubular	3	400	Hamilton-Corliss	..	....	Ft. Wayne	20	400	..
Maryland:												
Cambridge	2	300	Ames	3	330	Ball, Erie	3	200	G. E., Ft. Worth	80	86,000	..
Massachusetts:												
Boston	79	38,736	B. & W.	25	140,600	G. E., McIntosh-Seymour	39	115,400	G. E.	7,361	6,536,062	1,885,205
Concord	3	270	Hodge, Holyoke	1	300	Westinghouse	1 2b	200 833	Westinghouse, Westinghouse-Kerr, Allis-Chalmers	216	258,170	225
Fall River	8	2,100	B. & W.	..	.....	.....	4b	11,000	G. E.-Curtis	600	680,000	94,046
North Attleborough	2	766	Heine, Stirling	4	675	Hamilton, Fitchburg, Shepherd	..	....	Westinghouse	48	11,282	..
Norwood e.....	..	.....	.....	..	.....	.....	..	.....	.....	175	900-250	..
Peabody	3	657	Robb	3	1,216	.....	3	925	G. E.	242	216,800	1,000
Pittsfield	9	2,500	B. & W., Bigelow	2	1,000	Rice & Sargent	2	1,750	G. E.	121	518,375	3,000
Reading	3	375	Kendall, Hodge	4	980	Curtis, Allis	4	1,000	McEwen, G. E., W. E.	276.95	300,801	..
Taunton	6	2,400	Heine	4	5,100	McIntosh-Seymour	4	3,800	G. E., Allis-Chalmers	337	591,360	..
Springfield	24	9,300	Porcupine	6g 3j	18,570 2,835	West Jolly	46	19,025	G. E., West., Stanley, Ferry	..	2,453,857	600,988
Michigan:												
Alpena	3	715	Stirling, McN.	1	250	Allis-Chalmers	1	150	Bullock	36	..	..
Bay City	2	800	Wicks	2g	2,613	Allis, W. H. Curtis	2	1,950	.....	180	193a	..
Kalamazoo	2	620	Wicks	2g	1,200d	Corliss	2	1,200	G. E.	104.1	549,602	15,840
Ypsilanti	2	200	.....	1	350	.....	2	90	G. E.	25	..	300
Minnesota:												
Crookston h	4	625	Stirling	3	2,500	G. E., Russell, Westinghouse	3	1,190	G. E.	..	..	..
New Ulm	4	600	.....	2	612	McIntosh & Seymour, Lane & Bodley	2	475	Electric Machy.	125	25a	2,100
Missouri:												
St. Joseph	4	800	Lyons	1	500	.....	6	270	G. E.	..	..	..
Nebraska:												
Fairbury	2	500	Kenny	2	480	Murray-Corliss	2 1b	275 150c	Fort Wayne Westinghouse	..	..	1,670
New Hampshire:												
Lebanon	2	350	Holyoke	2	300	Ball & Russell	2	400	Ft. Wayne	11	14a	..
New Jersey:												
Hammononton	2	300	Atlas-Lebanon	2	290	Ball	2	160	Westinghouse	79	1	..
Orange	2	450	Heine	2	600	Hewes & Phillips	2	400	Ft. Wayne	70	35a	..
New York:												
Kingston	3	650	B. & W., Bigelow	3	700	Ormington & Sims	3	500	G. E.	260	..	..
Norwich	2	600	Keeler	3	400	Erie	3	290	G. E.	83	..	..
Owego	2	400	Wickerson	3g	850	DeLaval	4	800	G. E.	70	..	600
Saratoga Springs Substation .....	..	.....	.....	..	.....	.....	..	.....	.....	100	70a	..
Schenectady e.....	..	.....	.....	..	.....	.....	..	.....	.....	847	597,870	380,710
Solvay .....	..	.....	.....	..	.....	.....	..	.....	.....	57	10a	..
North Carolina:												
Concord e.....	..	.....	.....	..	.....	.....	..	.....	.....	75	30,000	..
Washington	2	1,000	B. & W.	2g	1,000	Curtis	2	1,000	G. E.	10	..	..
North Dakota:												
Bismarck	6	2,000	.....	5	2,500	L. & B.	5	2,000	.....	500	20a	..
Ohio:												
Cleveland	5	10,000	Stirling	4b	22,000d	Allis-Chalmers, Westinghouse	..	....	.....	500	395,000	800,000
Columbus	6	1,800	B. & W.	5b	5,000	Allis-Chalmers, Westinghouse	3	120	Westinghouse, Allis-Chalmers	500	225a	42,393
Conneaut	3	850	Erie	3	700	Erie	3	540	Warren, G. E.	80	31a	..
Defiance	2	500	Heine	2	450	Russell	2	300	Fort Wayne	53	47,600	..
Galion	3	1,100	Heine	3	650	Bass, Skinner, Allis-Chalmers	3	460	Allis-Chalmers	..	..	..
Marietta	2	400	.....	2	240	Buckeye	4	....	.....	50	..	..
Niles .....	..	.....	.....	..	.....	.....	..	.....	.....	25	24a	1a
Norwalk .....	..	.....	.....	3f	450	Town-Frick	3	300	Allis-Chalmers	90	..	7,500
Sidney	2	500	Wilkinson	2	875	G. E.	3	500	G. E.	22	22a	..
Troy	3	760	Stirling	2	840	Hamilton, Corliss, Russell	4	810	Ft. Wayne, Hobart	21	..	..
Oregon:												
Portland	47	12,816	Various	14 27j 3	35,450 81,100 1,500	.....	13 27	22,400 42,600	.....	71.28	..	663,537
Astoria	4	1,350	Cahall	..	.....	Watts-Campbell, Hamilton, McIn- tosh-Seymour	4	1,350	G. E.	70	15a	..

For footnotes, see page 886.

City	BOILERS		ENGINES		DYNAMOS			STREET LINES EQUIPMENT				
	Num-ber	Total rated horse-power	Make	Num-ber	Total rated horse-power	Make	Num-ber	K. W. capacity	Make	Total length of wire miles	Length of streets with overhead wire feet	Length of streets of underground conduit feet
Pennsylvania:												
Coraopolis.....	..	....	.....	3f	325	Buckeye, Warren	3	400	Crocker-Wheeler	..	..	..
Corry	3	500	Phoenix	3	500	Skinner, Noye, Clark	3	400	Burk, G. E., Bullock	27%	27%a	..
Meadville .....	..	....	.....	2	320	Phoenix, Riverside f	4	400	G. E.	45	..	..
Millvale	4	450	Titusville	2	180	Ede	2	150	Westinghouse	27	22a	..
Titusville	3	335	Titusville	1	175	Russell	2	96	Ft. Wayne	30	30a	..
Tyrone	5	1,600	Stirling	2g	1,500	G. E.	2	1,000	G. E.	85	..	..
Waynesboro	4	1,000	Marietta Keeler	4	1,050	Russell, Allis-Chalmers, De La-val	6	1,700	Bullock, Crocker-Wheeler, Allis-Chalmers	21	21a	..
South Carolina:												
Orangeburg	3	300	Lombard	4	525	Ridgway, Harrisburg	4	425	G. E., Ridgway	80	11a	..
Rock Hill	2	400	Brownell	1	400	Erie	1	260	Westinghouse	..	..	12a
Union	2	400	Lombard	3	600	Harrisburg	..	..	..	26	..	..
South Dakota:												
Mitchell	3	825	Heine, Lyons	3	850	Hamilton Corliss Diesel	3	600	Ft. Wayne, G. E.	145	84,000	850
Watertown	3	750	Stirling	2	700	Iron City, Hamilton	2	450	G. E.	60	160,000	3,200
Tennessee:												
Columbia	3	400	.....	2	400	.....	2	350	G. E.	40	15a	..
Knoxville	9	3,900	Bow	5	7,000	Cooper, G. E., Allis-Chalmers	5	6,800	G. E., Allis-Chalmers	400	90a	75,000
Texas:												
Galveston	4	200	Erie	..	1,000	Allis-Chalmers	3	750	.....	80	211,200	52,800
San Angelo	2	600	B. & W.	3	1,000	Allis-Chalmers	3	750	Allis-Chalmers, Westinghouse	40	12a	..
Sherman	1	300	Atlas	1	250	Allis-Chalmers	1	160	.....	..	..	..
Vermont:												
Bennington	3	525	Dillon	3k	1,000	Ball & Wood, Buckeye, Fitchburg	3	650	G. E.	120	20a	..
Burlington	4	900	Atlas	2g	300 1,050d	Watertown, Westinghouse	4	1,300	Crocker-Wheeler, Westinghouse	150	57a	..
Virginia:												
Fredericksburg ....	..	....	.....	3g	3,000	Holyoke	5	2,220	G. E., Ft. Wayne	37	13a	250
Washington:												
Bellingham	3	1,500	B. & W.	3	4,500	G. E. Curtis, Hamilton-Corliss	3	3,945	G. E., Allis-Chalmers	..	520,000	..
Seattle	4	3,290	Stirling	1	13,000	Allis-Chalmers	1	9,375	.....	3,167	..	..
Wisconsin:												
Janesville.....	5	750	.....	3	1,100	.....	8	1,750	.....	42	160,000	..
Marinette .....	..	..	.....	3j	4,500	Dayton-Globe	3	3,600	G. E., 739,000	..	300,000	..
Merrill	4	320	.....	1	250	Hardburg, Dayton Globe	5	550	Westinghouse	515	6,000	..
Wausau	2	600	Heine	1g	1,200	G. E.	3	1,600	Fort Wayne, National, Allis-Chalmers	1,182,274	..	..
Canada:												
Edmonton, Alta ..	16	7,200	B. & W.	7	14,000	Westinghouse W. & R., B. & M.	9	10,000	Westinghouse, G. E., Siemens	..	..	..
Lethbridge.....	8	2,400	B. & W.	3	3,100	Bells & Morcon	3	2,438	Westinghouse	..	..	..

FOOTNOTES—TABLE NO. 1: a—Miles; b—turbo-generators; c—Kva.; d—Kw.; e—purchase current; f—gas engine; g—turbines; h—reserve equipment; i—practically all overhead; j—waterwheels or water turbines; k—also has 288 h. p. in waterwheels.

TABLE 4.—“WHITE WAY” OR ORNAMENTAL STREET LIGHTING.

	No. of Standards	No. of Lamps	Kind of Lamps	Wattage or C. p. of Lamps	Cost of Installing Standard	Cost of Operation & Maintenance	Who pays Installation	Who pays Operation & Maintenance
Alabama:								
Dothan	179	179	Mazda	60w	†....	....	city	city
		716	Mazda	40w	....	....	....	....
Arkansas:								
Fort Smith	45	45	....	100w	†....	....	consumer	consumer
Pine Bluff	75	180	....	60w	....	....	....	....
		300	Mazda	60w	\$24.00	\$36.00	consumer	consumer
California:								
Pasadena	1,000	..	....	80-600	61.-474.00	.03½i	prop. owner	city
Riverside	1,211	1,397	....	48cp	*16.00	3.05	prop. owner	city
		373	....	32cp	†40.00	10.25	....	....
		77	....	20cp	....	....	....	....
Colorado:								
Trinidad	117	68	....	60cp	\$100.00	....	company	company
Florida:								
Jacksonville	279	200	Tungsten	100w	*26.00	18.50b	city	city
		179	Magnetite	....	....	50.00c	....	....
Georgia:								
Dublin	16	80	....	100w	†....	....	prop. owner	city
Griffin	36	..	....	60-100	50.00	20.00	merchants	city
Thomasville	6	30	Mazda c	80cp	†80.00	....	county	city
District of Columbia:	2,652	2,652	Mazda c	100cp	*50.00	21.35	company	city
Illinois:								
Canton	24	120	Mazda	60w	†80.00	40.00	merchants	d
Urbana	202	202	....	250cp	....	....	frontage	city

For footnotes, see page 887.

TABLE 4.—"WHITE WAY" OR ORNAMENTAL STREET LIGHTING.—Continued.

	No. of Stand- ards	No. of Lamps	Kind of Lamps	Wattage or C. p. of Lamps	Cost of Installing Standard	Cost of Operation & Maintenance	Who pays Installation	Who pays Operation & Maintenance
Indiana:								
Anderson	309	1,236	....	40w	†90.00	....	frontage & city	city
Bloomington	103	309	....	60w	....	....	....	....
Crawfordsville	42	42	....	40w	†1.00	....	city	city
Frankfort	99	168	....	100w	†84.60	40.50	city	city
Linton	16	396	....	60w	....	....	....	....
Marion	86	86	Mazda	60w	†50.00	2.00	merchants	city
Portland	101	344	Mazda	60w	*70.00	....	merchants	city
Valparaiso	8	..	Mazda c	40w	†80.00	12.50	merchants	city
				250cp	72.00	11.22	city e	city
				40w	....	....	....	....
				60w	....	48.00	company	county
Iowa:								
Cedar Falls	42	42	....	60w	....	....	....	....
Webster City	109	168	....	40w	†65.00	60.00	prop owner	city
		545	Mazda	48cp	†60.00	20.00	merchants	city
Kansas:								
Coffeyville	146	146	....	100w	†60.00	18.00	prop. owners	city
Topeka	253	584	....	60w	....	....	....	....
Wichita	282	1,070	Mazda	60w	†170.00	20.92	prop. owners	city
		282	Mazda	100w	....	....	company	city
		68	open arc	340w	292.00	....	....	....
		68	Tungsten	60cp	....	....	....	....
		68	Tungsten	80cp	....	....	....	....
Maryland:								
Baltimore	998	..	Luminous arcs	....	75.00	84.60	city	city
Massachusetts:								
Boston	41	41	Magnetite	500w	*....	87.52	frontage & company	city
Fall River	209	96	....	509w	....	....	....	....
Norwood	66	113	....	310w	....	....	company	city
Pittsfield	59	66	Mazda c	250cp	*....	....	city	city
		59	Luminous	....	*175.00	101.00	company	city
Michigan:								
Kalamazoo	233	233	....	100w	†25,226.00f	33.00	city	city
Ypsilanti	4	932	....	60w	....	....	city	city
		..	G. E. arc	500	150.00	27.00	city	city
Minnesota:								
Crookston	58	58	Inverted luminous	....	....	....	city	city
New Ulm	44	..	Mazda	60w	....	....	merchants	city
			Mazda	100w	....	....	....	....
Nebraska:								
Fairbury	89	89	Mazda	60w	†60.00	1,641.60f	merchants	city
	..	356	Mazda	40w	....	....	....	....
New Jersey:								
Hammononton .....	..	..	....	40wg	....	....	town	town
Newark	80	..	Flaming arcs	2500cp	....	....	company	company
New York:								
Kingston	241	..	Magnetite	....	....	....	company	city
Owego	33	165	....	60w	†40.00	....	company	city
Schenectady	69	69	Magnetite	....	*78.65	93.10	company	company
North Carolina:								
Concord	52	..	Mazda C	125cp	....	....	city	city
Gastonia	6	6	Mazda	100w	....	....	city	city
	..	24	Mazda	60w	....	....	city	city
High Point	60	300	Mazda	60w	....	** 35.00	company	city
North Dakota:								
Bismarck	150	..	....	60w	....	....	....	city
			....	100w	....	....	....	....
Ohio:								
Columbus	1,235	6,055	Mazda C	100w	156.40	36.30	prop. owners	city
Defiance	14	14	....	100w	†42.00	32.40	private	private
	..	56	....	60w	....	....	owners	owners
Gallion	38	..	Mazda C	60-100	....	....	city	city
Niles	87	317	....	....	....	....	city	city
Troy	14	64	....	60w	40.00	5.00	city	city
Oregon:								
Portland .....	..	..	....	....	85.00	4.00	Imp. League	owners
Pennsylvania:								
Tyrone	21	105	....	100w	†60.00	30.00	prop. owners	prop. owners
South Carolina:								
Orangeburg	17h	118	Mazda C	60cp	....	....	merchants	company
Rock Hill	21	105	....	60cp	†100.00	32.50	prop. owner	city
Union	40	40	....	100w	....	....	city and	....
	..	160	....	60w	†5,000.00	31.25	prop. owners	city
South Dakota:								
Mitchell	46	46	....	100w	....	....	....	city
	..	184	....	60w	....	..081	city	city
Tennessee:								
Knoxville	20	..	....	....	....	50.00	merchants	city
Texas:								
Galveston	64	64	....	100w	....	....	county	city
	..	256	....	60w	....	....	....	....
	138	138	Inverted arc	....	....	....	city	city
Virginia:								
Norfolk	55h	550	....	60cp	....	2,000.00 f	merchants	city
Washington:								
Bellevue .....	..	..	Tungsten	40w	†75.00	10.76	consumer	consumer
Seattle	1,692	..	....	....	†235.30	....	prop. owners	city
Wisconsin:								
Janesville	24	120	....	60w	†75.00	48.00	consumer	consumer
Marquette	42	210	Tungsten	60w	†65.00	36.00	merchants	merchants
Wausau	159	159	Mazda	60w	....	....	city	city
	..	136	Mazda	40w	....	....	....	....
Canada:								
Edmonton, Alta.	178	262	Magnetite	....	123.53	....	j	j
Galt, Ont.	340	..	Tungsten	100w	....	....	....	....
	..	..	Mazda C	500w	....	....	k	commission
Leambridge, Ont. ....	..	420	....	100w	....	....	city	city

a—Standards are owned by individuals and are on meter. b—incandescents. c—Arcs. d— $\frac{1}{2}$ by merchants; $\frac{1}{2}$ by city. e—And commercial association. f—Total cost. g—2-cluster and 3-cluster lamps are used. h—Arches. i—per kw. h. j—two-thirds installation and operation costs charged to property owners; one-third paid by city. k—Ontario Power Commission paid 35 per cent. *—One-light standard. †—3-light standard. ‡—4-light standard. §—5-light standard.

TABLE 2—CURRENT GENERATED AND SOLD, CONNECTED LOAD AND FUEL STATISTICS.

	Current generated and sold				Connected load				Fuel statistics			
	Total current generated, watt hrs.	Used for street lights, Kilo-watt hrs.	Sold commercially, Kilo-watt hrs.	No. of public arcs	No. of comm. arcs	No. of public incand.	No. of comm. incand.	Total lighting load, kilowatts	Coal used — tons	Price per ton	Screenings used — tons	Price per ton
Alabama:												
Bessemer	1,500,000	54,000	796,000	29	1	118	....	....	3,650	\$3.00	....	..
Dothan	10,912,052	1,024,375	7,969,019	555	1,185	97	125,178	8,953	20,000	2.12	....	..
Arkansas:												
Fort Smith	6,038,224	653,220	2,087,343	271	..	..	67,754	4,215	....	....	....	..
Little Rock	50,000	....	....	568	..	..	8,000	300	....	....	500	..
Paragould	2,144,510	136,560	1,114,368	25	62	456	....	2,325	5,000	3.00	....	..
California:												
Pasadena	5,793,290	1,037,580	3,699,685	259	none	none	5,594	2,100	....	....	....	..
Riverside	3,816,892	607,849	3,160,793	40	none	none	70,412	1,123	none	....	none	..
Colorado:												
Grand Junction	1,786,475	155,491	959,087	89	5	15	15,000	400	4,587	1.87	1,485	\$1.20
Montrose	16,313,209	268,691	12,130,212	34	5	14	....	....	3,000	2.25	....	..
Trinidad .....	....	....	....	none	none	670	6	....	42,825	1.10	....	..
Connecticut:												
South Norwalk	1,612,510	194,470	1,169,055	40	20	355	22,821	1,419	1,880	3.40	....	..
Stamford	4,099,910	575,700	3,337,889	118	none	866	40,000	....	5,000	3.60	....	..
Wallingford	925,220	169,655	....	....	..	..	38,400	....	2,000	4.28	....	..
Florida:												
Jacksonville	13,779,830	1,342,000	none	1,116	none	576	200,000	....	3,000	3.70	....	..
Tallahassee .....	....	....	....	82	..	36	....	....	....	....	....	..
Georgia:												
Dublin	192,000	....	....	59	..	..	15,000	....	3,650	3.40	....	..
Griffin	1,185,500	153,050	1,011,290	none	..	..	....	....	....	....	....	..
Thomasville	813,280	156,600	656,680	none	..	..	....	....	3,000	3.35	....	..
Illinois:												
Blue Island	2,161,170	112,230	666,820	139	..	71	1,000	....	1,000	1.97	12,000-15,000	1.25
Canton .....	....	....	....	210	..	..	15,000	500	2,400	1.40	....	..
Litchfield .....	....	....	....	87	..	..	....	125	8,000	1.65	....	..
Urbana .....	....	....	....	139	..	..	....	....	....	....	....	..
Indiana:												
Anderson	5,400,000	560,000	....	325	25	1,545	....	....	14,000	1.85	....	..
Bloomington	2,400,000	480,000	1,920,000	....	..	130	....	900	6,000	1.15	some	1.35
Crawfordsville	1,719,314	1,126,695	....	224	none	23	7,000	1,430	14,000	1.05	....	..
Frankfort	3,009,000	304,560	595,390	294	50	18,000	....	....	2,700	1.25	....	..
Linton .....	....	....	....	....	..	135	....	....	....	....	....	..
Madison	955,880	....	....	....	..	..	....	....	....	....	....	..
Marion .....	....	....	....	....	..	..	....	....	....	....	....	..
New Castle .....	....	....	....	....	..	..	....	....	3,000	1.50	....	..
Peru	1,460,000	197,640	1,136,124	168	..	5	....	209b	4,000	.97	....	..
Portland	889,000	....	....	165	..	21	....	300	2,190	2.55	....	..
Richmond	4,000,000	6,000	....	400	40	58	....	1,300	....	2.20	....	..
Valparaiso	720,000a	72,000	....	107	..	..	....	200	....	....	....	..
Iowa:												
Cedar Falls	720,000	100,000	620,000	..	..	280	14,000	215	2,850	2.745	some	..
Webster City	788,400	75,000	645,900	..	..	..	....	310	3,650	1.25	....	..
Kansas:												
Coffeyville	3,551,030	237,555	2,906,400	27	3	191	....	993	....	....	3,400	2.30
Ottawa	743,852	183,891	400,000	472	none	1,422	none	280	2,379	2.60	....	..
Topeka	709,330	801,262	....	345	125	1,340	....	10,077	....	....	....	..
Wichita	19,869,000	....	14,576,000	....	..	..	....	....	....	....	....	..
Kentucky:												
Henderson	2,631,737	1,189,464	171,384	567	30	100	51,037	8,305	10,291	1.00	30,000d	2.00
Lexington	2,280,000	....	....	....	..	..	....	....	....	....	....	..
Louisiana:												
Alexandria	1,765,900	205,040	1,102,360	2	1	375	3,000	....	2,375	3.25	....	..
New Iberia	288,000	144,000	144,000	50	..	..	....	....	....	....	....	..
Maryland:												
Cambridge	302,000	68,000	193,222	15	none	150	5,200	170	1,121	3.50	....	..
Massachusetts:												
Boston	19,198,868	134,458,377	....	..	..	..	112,277	198,694	200,888	4.43	1,290	3.21
Concord	194,137,400	199,570	446,283	..	..	976	18,000	300	350	1.166	....	..
Fall River	828,200	1,736,650	9,704,746	1052	188	625	....	5,902	10,703	4.50	....	..
No. Attleboro	13,914,400	93,810	500,070	none	2	793	....	850	400	....	....	..
Purchased 553,990 kwh.												

For footnotes, see page 880.

TABLE 2.—CURRENT GENERATED AND SOLD, CONNECTED LOAD AND FUEL STATISTICS (Continued).

	Current generated and sold			Connected load			Fuel statistics					
	Total current generated. Kilo-watt hrs.	Used for street lights. Kilo-watt hrs.	Sold commercially. Kilo-watt hrs.	No. of public arcs	No. of comm. arcs	No. of public incand.	No. of comm. incand.	Total lighting load kilowatts	Coal used —tons	Screenings used —tons	Price per ton	Other sources of power
Massachusetts—Continued.												
Norwood	146,685	991,883	128,950	136	..	..	24,560	1,228	2,225	..	..	All purchased.
Pittsfield	1,828,260	1,405,800	288,500	78	6-2	712	30,500	1,530	2,670	..	..	..
Reading	5,121,340	3,597,200	627,720	200	..	1,250	70,000	1,000	1,756	..	..	..
Springfield	86,476	17,978,619	3,846,445	1,414	124	2,049	259,515	13,452	23,500	407	2.55	Part purchased.
Taunton	27,900,008	2,300,000	2,300,000	26	..	1,587	..	..	6,300	..	..	..
Michigan:												
Alpena	128,950	128,950	128,950	136	..	..	..	..	..	..	..	..
Bay City	1,697,500	900,000	900,000	611	..	1,500	..	290	834	..	..	..
Kalamazoo	1,027,660	..	..	554	..	..	..	..	187	..	..	Water power.
Ypsilanti	94,560	..	..	154	..	..	..	..	..	..	..	..
Minnesota:												
Crookston	2,000,000	..	..	124	..	..	..	..	350	..	..	4,500 water h. p.
New Ulm	784,328	..	..	110	..	..	..	..	..	..	..	..
Missouri:												
St. Joseph .....	..	..	..	716	..	..	..	..	..	..	..	..
Nebraska:												
Fairbury	458,648	35,418	408,548	..	..	..	..	..	..	..	..	..
New Hampshire:												
Lebanon	413,900	38,625	..	6	..	230	10,000	190	240	..	..	Water power.
New Jersey:												
Hammononton	379,301	..	..	17	5	397	..	..	..	..	..	..
Orange	750,000	750,000	..	372	..	200	..	200	200	..	..	..
New York:												
Kingston	2,351,400a	909,083	1,448,317	448	52	710	24,000	1,500	2,800	..	..	Water power purchased.
Norwich	374,224	153,400	208,000	..	..	212	9,370	394	2,848	..	..	..
Owego	916,107	184,340	751,767	69	..	212	9,890	350	2,000	..	..	..
Saratoga Springs	e2,131,803	334,083	1,088,982	159	2	260	..	2,165	..	..	..	All power purchased.
Schenectady	a	1,611,178	1,964,605	1,020	301	360	322,070	26,477	..	..	..	All power purchased.
Solvay	a	80,000	210,000	..	..	260	15,000	600	..	..	..	..
North Carolina:												
Concord	a	905,670a	420,000	..	..	..	2,000	375	40	..	..	Purchased.
Gastonia	480,000a	..	..	150	..	60	..	250	..	..	..	All power purchased.
High Point .....	..	..	..	75	..	..	4,000	250	1,460	..	..	All power purchased.
Washington .....	..	..	..	..	..	..	..	..	..	..	..	..
North Dakota:												
Bismarck	200,000	..	..	100	..	..	..	..	f	f	1.15	..
Ohio:												
Cleveland	30,000,000	1,600,000	28,400,000	12,000	..	100	..	2,050	32,850	..	..	..
Columbus	8,321,217	5,976,647	2,344,570	2,779	..	6,055	..	490	20,000	..	..	..
Conneaut	613,782	116,307	497,475	113	..	2,25	..	150	3,000	..	..	All power purchased.
Defiance	1,522,610a	96,451	1,426,159	22	..	..	500	125	..	..	..	Gas, power purchased.
Marion .....	..	..	..	..	..	..	..	..	..	..	..	All power purchased.
Niles	1,679,700a	241,095	823,400	..	..	750	7,000	98	300	..	..	Water power.
Sidney	1,250,000	240,000	751,000	128	..	100	15,000	350	3,500	..	..	..
Troy	1,500,000	250,000	..	165	..	..	..	450	3,000	..	..	..
Oregon:												
Astoria	5,556,000a	214,443	4,315,264	140	46	..	..	2,366	4,216	..	..	All current purchased.
Portland	88,792,619	6,136,314	78,287,354	3,635	..	1,201	..	33,955	59,614	..	..	Sawdust, mill waste, fuel oil.
Pennsylvania:												
Corasopolis	600,000	110,000	490,000	91	2	65	6,500	160	2,580	..	..	Gas.
Meadville	286,350	4,105	280,245	98	60	2	5,000	750	7,284	..	..	4,963,000 ft. of gas at 30c.
Titusville .....	..	..	..	166	..	..	..	..	..	..	..	..
Tyrone	2,773,364	242,724	2,060,608	105	39	115	4	700	5,365	..	2.25	..
Waynesboro	2,161,950	217,600	1,944,350	..	..	163	10,000	300	5,000	..	..	..
South Carolina:												
Orangeburg	800,000	146,000	480,000	70	..	56	20,000	350	3,000	..	..	Purchased.
Rock Hill	400,000	..	..	85	..	..	7,000	..	2,500	..	..	..
South Dakota:												
Mitchell	1,125,579	100,680	708,000	78	..	8	..	460	900	..	..	Diesel engines.
Watertown	100,000	..	..	30	..	202	..	..	4,000	..	..	..

For footnotes, see page 880.

TABLE 2—CURRENT GENERATED AND SOLD, CONNECTED LOAD AND FUEL STATISTICS (Continued).

Current										Fuel statistics							
Generated and sold				Connected load			Total lighting and power load			Screenings		Price per ton		Other sources of power			
Total current generated. Kilo-watt hrs.	Used for street lights. Kilo-watt hrs.	Sold commercially. Kilo-watt hrs.	No. of public arcs	No. of comm. arcs	No. of public incand.	No. of comm. incand.	Total lighting load kilowatts	Coal used —tons	Price per ton	Screenings —tons	Price per ton						
Tennessee:																	
Columbia	25,000,000	1,000,000	15,000,000	61	none	48	7,500	225	2.25	....	..	Water power.			
Knoxville	.....	.....	.....	500	150	156	120,000	12,150	1.35	....	..				
Texas:																	
Galveston	.....	.....	.....	570	..	320	9,000	800	....	....	..	Oil at 80c. a bbl.		
San Angelo	10,800,000	30,000	10,770,000	25	none	160	9,000	....	....	....	..	600,000 gal. fuel oil at \$1.325 a bbl.		
Sherman	.....	.....	.....	..	..	..	....	....	....	....	..	Gas at 9c.		
Vermont:																	
Bennington	1,260,000	118,300	772,000	none	none	200	28,000	2,200	4.35	....	..				
Burlington	1,394,042	484,200	909,842	247	2	106	20,000	300c	4.27	....	..				
Virginia:																	
Fredericksburg	1,197,400	287,250	929,000	95	..	30	....	100	....	....	..	Water power.		
Washington:																	
Bellingham	34,679,400	475,000	34,204,400	228	141	70	....	3,965	19,209	....	..	192,472 gals. oil at 91c. a bbl; purchased.		
Seattle	38,404,910	4,958,161	25,929,891	605	none	7,213	7,329	....	10,500	....	..	Oil at \$1 a bbl. and water power.		
Wisconsin:																	
Janesville	3,284,000	446,000	2,842,000	126	..	..	27,245	1,362	....	....	..	Water power.		
Marquette	3,758,288	179,850	2,235,395	none	none	93	9,000	2,250	....	....	..	Water power.		
Merrill	.....	100,000	600,000	none	none	93	9,000	....	....	....	..	Water power.		
Wausau	5,557,220	251,830	4,644,090	153	none	795	13,000	372	4.50	....	..				
Canada:																	
Edmonton, Alta.	23,219,000	2,233,580	9,908,336h	493	..	664	26,164	50,000	3.50	....	..				
Lethbridge, Alta.	3,415,000	248,960	2,005,940	112	..	150	.....	12,000	1.20	....	..				
a—Power purchased; b—horse power; c—day power load; d—nut and slack; e—sub-station, no auxiliary plant. f—lignite used; g—mine run; h—current also sold to street railway and waterworks.																	

a—Power purchased; b—horse power; c—day power load; d—nut and slack; e—sub-station, no auxiliary plant. f—lignite used; g—mine run; h—current also sold to street railway and waterworks.

TABLE 3—STREET LIGHTING.

	Private or municipal plant	Arc lamps				Incandescent lamps				Miles of streets lighted	Cost		Hours lamps burn per year	
		Number	A.C. or D.C.	Type	Amp.	Watts	Miles of streets lighted	Cost per lamp	Type		C.P.	Watts		Miles of streets lighted	Cost per lamp
Alabama:														
Bessemer	P	29	A.C.	Encl.	7.5	540	13	\$62.50	Mazda	100-250	75	..	\$24.00	4,000
Dothan	M	555	A.C.	Encl.	6.6	..	..	60.00	Mazda Series	60-100	80	..	20.00	4,000
Mobile	P		A.C.											
Arkansas:														
Fort Smith	P	271	A.C.	Encl.	6.6	550	62	55.00	..	..	..	..	..	4,025
Little Rock	M	568	A.C.	..	4	320	..	32.00	..	..	..	..	..	4,000
Paragould	M	10	A.C.	..	6.6	420	..	10.00	Mazda	32	40	25	11.76	3,760
Pine Bluff	P	25	A.C.	Encl.	6.6	..	..	..	Mazda series	32	40	..	1.25	..
California:														
Pasadena	M	40	A.C.	Encl.	..	500	155h	48,573.00e	..	..	50	48.7	3.46	3,000-4,000
Riverside	M		A.C.				5	39.20	Gem & Mazda	35	50	..	..	3,400
Colorado:														
Grand Junction	P	89	A.C.	Encl.	6.6	480	14	82.50	Tungsten Series	40	60	..	27.00 to 30.00	3,832
Montrose	P	34	A.C.	Encl.	6.6	475	..	72.00	..	40-60	..	..	18.00 to 21.00	a
Trinidad	..	..	..	..	..	..	..	..	C Mazda	60-200	..	..	15.00 to 50.00	4,000
Connecticut:														
So. Norwalk	M	40	D.C.	Encl. Mag.	5.5	375	3.5	2,260.00e	Mazda	80	59.4	14.5	3,834.00e	4,000
Stamford	P	118	D.C.	Magnetite	6.6	520	..	80.00	Mazda	60	75	..	18.00	4,000
Wallingford	M	..	..	..	..	..	..	..	..	32-350	40-400	22.8	14.00 to 80.00	1,600-3,810
Florida:														
Jacksonville	M	1,116	A.C.	Magnetite	4	320	90	52.54	..	..	60-100	..	18.50	4,000
Tallahassee	..	82	A.C.	Encl.	6.6	..	5	75.00	Mazda	..	100	..	25.00	b
Georgia:														
Dublin	M	59	A.C.	Encl.	6.6	500	25	60.00	Series	150-400	..	..	9.35-17.45	3,256
Griffin	M	49	A.C.	Encl. & Flam.	6.6	500-550	4.5	40.50	Mazda C	100-250	..	7	15.00 to 40.00	4,000
Thomasville	M	..	..	..	..	..	..	..	Mazda	80-400	..	..	..	..
District of Columbia:														
..	P	985	D.C.	Encl. and Magnetite	4.5, 6.6	520-550	..	72.50 to 93.10	..	56-250	..	..	15.00 to 50.85	3,942
Illinois:														
Blue Island	M	139	A.C.	Encl.	6.6	500	20	39.00	Tungsten	100-250	80-125	20	..	3,650
Canton	P	210	A.C.	Encl.	6.6	250	..	42.00 to 54.00	..	..	..	..	..	2,500-4,000
Litchfield	P	87	A.C.	Encl.	6.6	500	..	70.00	..	..	..	..	..	..
Urbana	P	129	A.C.	Encl.	6.6	546	10	65.00	..	..	..	..	..	2,180

Indiana:		224	A.C.	Magnetite	4. & 6.6	300-450	..	50.00	120	Series	250	100	..	50.00	a
Bloomington	M	204	D.C.	Encl.	..	260-450	29	10,200.00e	23	Carbon	100	60	..	22.00	a
Crawfordsville	M	136	D.C.	Encl.	4.0	310	15	80.00	12	..	100	..	..	144.00	4,000
Frankfort	M	284	D.C.	Encl.	6.6	415	23	29.00	51	Mazda	100-400	250	..	..	..
Linton	M	188	D.C.	Encl.	8.2	600	20.5	45.00	32	C Mazda	350	150	..	25.00	..
Marion	M	188	D.C.	Encl.	6.6	500	..	..	5	..	..	..	..	..	..
New Castle	M	188	D.C.	Encl.	7.5	320	..	24.00	58	C Mazda	250	300	..	..	4,000
Peru	M	406	D.C.	Encl.	4.0	480	..	55.00	..	..	80-400	..	..	18.00b-55.00a	..
Portland	M	107	D.C.	Encl.	6.6	..	..	..	..	..	..	..	..	..	..
Richmond	M	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Valparaiso	M	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Iowa:		..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cedar Falls	M	..	..	..	..	..	..	..	280	C Mazda	60	60-100	..	6.50 to 50.00	3,500
Webster City	M	..	..	..	..	..	..	..	405	Mazda C & B	..	..	..	..	..
Kansas:		160	A.C.	Encl.	6.6	450	..	36.00	191	C Mazda	100	..	..	12.00	b
Coneyville	M	26	A.C.	Encl.	6.6	272	94.4	38.20	156	Series	80	..	..	19.20	3,093
Ottawa	M	472	D.C.	Flaming	4	..	..	..	1,266	Multiple	60-100	..	..	36.58	2,984
Topeka	M	..	..	..	..	..	..	..	1,54	Tungsten	80	100	..	20.00	3,318
Kentucky:		298	D.C.	Open	4	340	5.3	66.00	1,073	Tungsten	60	80	..	18.00	2,000
Whitchita	P	47	D.C.	Open	4	340	..	35.00	68	Tungsten	60	80	..	9.55	4,000
Louisiana:		..	..	..	..	..	..	..	45	Tungsten	80	100	..	10.60	..
Henderson	M	567	A.C.	Encl.	5 & 7.5	500	70.8	74.00	279	C Mazda	100-1000	100-525	..	27.50	4,000
Lexington	P	..	..	..	..	..	..	..	100	Mazda	80	100	..	..	4,015
Maryland:		2	A.C.	Encl.	6.6	450	..	..	401	Mazda C	100-600	75-300	..	..	3,000
Alexandria	M	50	A.C.	Encl.	6.6	..	..	..	375	C & Carbon	16-100	..	..	..	..
New Iberia	M	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Baltimore	P	1,555	..	Encl.	4.0	320	71	60.00	1024	..	40	50	..	19.80	4,000
Massachusetts:		849	..	Encl.	4.0	320	38	72.00	153	..	40	50	..	31.20	..
Boston	P	998	A.C.	Encl.	6.6	528	5	84.60	586	..	80	60	..	14.91	..
Concord	P	15	..	Encl.	6.6	476	1.5	75.00	150	C Mazda	60	50	..	20.40	4,000
Fall River	P	4,923	D.C.	Magnetite	6.6	500	..	87.52	2,917	Tungsten	40	50	..	18.33	..
Newton	M	96	D.C.	Flaming	6.6	500	..	148.05	1,176	Tungsten	60	75	..	21.14	3,828
No. Attleboro	M	956	D.C.	Magnetite	6.6	509	..	..	16	Tungsten	80-320	100-400	..	25.48 to 84.08	4,000
Norwood	M	161	..	Magnetite	4.0	310	71	58.40 to 109.50	978	Mazda	40	50	..	25.00	4,000
Peabody	M	78	D.C.	Encl.	..	..	..	..	625	..	40-100	..	..	..	a&b
Pittsfield	M	51	A.C.	Encl.	..	..	..	..	1,766	C Mazda	60-350	..	..	8.40 to 18.30	2,250
Reading	M	1,605	D.C.	Luminous	6.6	500	..	..	600	C Mazda	250	45	..	..	2,857
Springfield	P	43	D.C.	Magnetite	5	400	..	..	66	C Mazda	32-100	40-125	..	..	3,857
Taunton	M	26	D.C.	Invert. Mag.	5	400	..	..	712	Mazda	60	50	..	12.09	4,000
Bay City	M	611	A.C.	Flaming	6.6	475	..	..	1,250	..	600-1000	325-500	..	16.50	4,000
Kalamazoo	M	554	D.C.	Encl.	4	320	180	70.00	9934	Mazda C	32-60	40-75	..	70.00 to 97.50	..
Ypsilanti	M	154	D.C.	Flaming	4.0	475	104.1	75.00	460	Tungsten	80	80	..	9.70 to 14.50	4,000
Minnesota:		110	A.C.	Encl.	6.6	..	15	..	1,587	C Mazda	60-600	40-366	..	15.00 to 20.00	4,000
New Ulm	M	716	D.C.	S.E. Magnetite	4	320	..	47.80	..	..	..	..	..	..	4,000
St. Joseph	M	..	..	..	..	..	..	..	..	..	..	..	..	..	4,000
Fairbury	M	..	..	..	..	..	..	..	96	Mazda	100	120	..	..	4,000
Lebanon	P	6	A.C.	Flaming	7	450	..	50.00	230	Mazda	60	..	..	12.50	a&b
Jersey City	P	2,015	A.C.	Encl.	4. & 6.6	450	206	70.44-110.00	397	Series	32	40	..	10.00b	..
Hammonton	P	10	A.C.	Encl.	10	480	..	50.00a	140	Vacuum B	25	40	..	17.60	a,b
Newark	P	2,823	A.C.	Flaming	7.5	550	306h	64.50	140	Vacuum B	32	45	..	15.85	4,000
Orange	M	372	D.C.	Encl.	4	300	35	96.75	242	Mazda C	60	..	..	64.50	4,000
Kingston	P	448	D.C.	Magnetite	4	320	..	57.50	200	Mazda	..	..	..	14.00	4,000
Norwich	P	..	..	..	..	..	..	70.00 to 80.00	710	C Mazda	32	35	..	16.00	4,000
New York:		..	..	..	..	..	..	..	49	C Mazda	400	..	..	40.00	4,000
..	..	..	..	..	..	..	..	..	134	C Mazda	250	..	..	25.00	..
..	..	..	..	..	..	..	..	..	64	C Mazda	50	..	..	18.00	..

For footnotes, see page 892.

TABLE 3—STREET LIGHTING (Continued).

Private or municipal plant	Arc lamps				Incandescent lamps				Miles of streets lighted	Cost per lamp	Hours lamps burn per year	
	Number	A.C. or D.C.	Type	Amp.	Watts	Miles of streets lighted	Cost per lamp					
New York—Continued.												
Owego	69	D.C.	Encl.	5.5	450	17	68.25	212	Mazda	48-80	60-80	9.89 to 18.00
Saratoga Springs	159	A.C.	Encl.	6.6	500	70	75.00	260	Car. & Mazda	32-80	40-100	21.00
Schenectady	929	D.C.	Encl.	4	320	124.85	60.00	459	..	..	..	3,936
..	62	D.C.	Encl.	6.6	500	.75	92.00	..	..	..	..	..
..	2	A.C.	Encl.	6	450	..	60.00	..	..	..	..	..
..	12	A.C.	Encl.	6	450	..	73.00	..	..	..	..	..
Solvay	..	..	..	..	..	..	..	260	Mazda C	100-250	70-175	4,000
North Carolina:												
Concord	..	..	..	..	..	..	..	226	Tungsten	32-500	..	3,650
Gastonia	..	..	..	..	..	..	..	278	Mazda C	250	..	3,650
High Point	150	D.C.	Magnetite	4	320	15	60.00	60	Multiple	..	..	..
Washington	60	A.C.	Encl.	6.6	520	..	60.00	15	Mazda C	200	..	25.00
Ohio:												
Cleveland f	12	D.C.	Magnetite	4	330	30	43.80	82	Mazda C	600	300	4,000
Columbus	14	A.C.	Encl.	6.6	425	40	43.80	..	Mazda B	80	100	..
..	2,279	A.C.	Encl.	6.6	400	225	44.52	6,025	..	..	..	4,000
Conneaut	..	D.C.	..	..	..	..	..	..	Mazda	80-200	100-250	..
Defiance	98	D.C.	Flaming	4.0	320	9	70.00	225	Mazda	40-100	..	16.00 to 40.00
Gallion	..	..	..	..	..	..	..	665	Mazda C	200	150-250	3,600
Marietta	..	..	..	..	..	..	..	308	Mazda C	60-400	..	2,320
Niles	..	..	..	..	..	..	..	710	Series	..	..	4,000
Sidney	128	D.C.	Flaming	4	320	10	56.00	28	Nitrogen filled	..	60	3,553
Troy	146	A.C.	Encl.	7.5	550	30h	6021.00	163	and Mazda	..	..	4,000
Oklahoma:												
Durant	40	D.C.	Encl. Mag.	4	330	..	3.50	..	..	..	..	4,400
Oregon:												
Astoria	140	D.C.	Magnetite	4	350	5	64.80	..	C, C4, D, B, X, etc.	..	150-450	3,650
Portland	162	D.C.	Magnetite	4	440	..	63.00	1,201	..	..	..	53.40 to 57.00
..	3,473	A.C.	Magnetite	4	320	..	51.00	..	..	..	..	4,072.05
Pennsylvania:												
Corneville	91	..	..	..	..	..	..	585	Nitrogen	80-400	..	25.00 to 55.00
Corryville	95	A.C.	Encl.	4	300	7	40.00	35	Series	100	80	4,380
Meadville	200	D.C.	Flaming	4	320	8	54.20	277	Series	60-100	60-100	13.50 to 17.00
Millvale	98	D.C.	Flaming	4	320	22	54.00	60	Series	250	75	5858.64
Titusville	150	D.C.	Open	9.6	320	30	54.00	15	Tungsten	..	..	4,380
Tyrone	105	D.C.	Magnetite	4	320	17	50.00	115	Mazda	500	..	3,850
Waynesboro	..	..	..	..	..	..	..	163	Tungsten	40	45	3,650
..	..	..	..	..	..	..	..	..	Mazda C	60-1000	..	4,000
South Carolina:												
Orangeburg	18	A.C.	Encl.	6.6	480	18h	50.00	140	Mazda C	60-1000	75	..
Rock Hill	90	D.C.	Flaming	4.4	312	12	50.00	56	Mazda	60	..	20.00
South Dakota:												
Mitchell	78	D.C.	Magnetite	4	325	28	60.00	8	Multiple	90	100	27.00
Watertown	30	D.C.	Magnetite	6.6	510	1	100.00	202	Mazda C	80	..	30.00
Tennessee:												
Knoxville	500	A.C.	Encl.	6.6	500	90	72.50	187	Mazda B & C	32-250	87-160	22.00 to 38.50
Texas:												
Galveston	570	D.C.	Magnetite	4	320	..	56.00	320	Mazda	60-100	..	..
Vermont:												
Bennington	..	..	..	..	..	..	..	..	..	..	..	..
Burlington	247	A.C.	Encl.	6.6	425	57	65.00	238	Mazda C	80-250	75-aver	6700e
..	..	..	..	..	..	..	..	106	Mazda Nitro.	40-600	..	24.00
Virginia:												
Fredericksburg	95	D.C.	Encl.	6.6	75	..	58.00	20	Series	60	100	22.00
Norfolk	669	A.C.	Encl.	6.6	400	..	..	274	Series	..	75	..
Washington:												
Bellingham	229	A.C.	Encl.	6.6	450	60h	..	70	Tungsten	..	40-200	13.20 to 42.00
Wisconsin:												
Janesville	200	A.C.	Encl.	6.6	425	..	59.00	120	Mazda C	100	65	24.00
Marquette	126	A.C.-D.C.	Encl. Flam'g	4-6.6	250-350	60	61.50	93	Carbon	32	120	23.00
Merrill	..	..	..	..	..	..	..	..	Mazda C	250	200	23.00
Wausau	153	A.C.	Encl.	6.6	450	..	25.20	795	Mazda	..	40-60	4200e
Canada:												
Edmonton, Alta.	483	D.C.	Magnetite	6.6	..	..	..	664	Series	40-250	..	..
Galt, Ont.	..	..	..	..	..	..	..	800	Series	100	125	8.50
Lethbridge, Alta.	112	A.C.-D.C.	Encl. Magnetite	6.6	500	..	..	150	Series	100	100	3,750
St. Catharines, Ont.	..	..	..	..	..	..	..	1400	..	100	100	8.00
a—all night. b—moonlight schedule. c—per kw. h. d—in towns of Wilmington, No. Reading, Lynnfield and Reading. e—total annual cost. f—Cleveland has 12,000 pub- lic arcs in all. g—all dark nights. h—total mileage lighted. i—semi-municipal.												

a—all night. b—moonlight schedule. c—per kw. h. d—in towns of Wilmington, No. Reading, Lynnfield and Reading. e—total annual cost. f—Cleveland has 12,000 pub-
lic arcs in all. g—all dark nights. h—total mileage lighted. i—semi-municipal.

TABLE 5—RATES FOR LIGHT AND POWER—CONTINUED.

	Mini- rate, cents.	Min. amt. to which it applies k. w. h.	Max. amt. to which it applies k. w. h.	Discounts.	Minimum payment.
New Jersey:					
Newark	3	25,000	10	500	1.00
New York:					
Norwich	6	800	12	100	1.00
Saratoga Spgs.	1 1/2	5,500	10	30	1.00
North Carolina:					
Schenectady	10	600	8	600	.50
Gastonia	11 1/2	50	12 1/2	50	1.00
High Point	10	35,000	3	1,200	1.00
Washington	11 1/2	12,000	9	1,000	1.00
North Dakota:					
Bismarck	10	35,000	3	1,200	1.00
Cleveland	1 3/5	12,000	9	1,000	1.00
Columbus	4	127,000	2	1,000	1.00
Ohio:					
Sidney	7 d	10 a	10 a	50	1.00
Okahoma:					
Durant	5	9	15	20	1.00
Oregon:					
Astoria	4	25	14	25	1.00
Portland	2 1/2	4,000	10	200	1.00
Pennsylvania:					
Tyrone	2	500	6	10	1.00
Waynesboro	2	2,000	10	10	1.00
South Carolina:					
Rock Hill	6 1/2	200	10	100	1.00
South Dakota:					
Mitchell	1	60	15	20	1.00
Watertown	5	25	14	25	1.00
Vermont:					
Burlington	2	4,000	10	200	1.00
Virginia:					
Norfolk	6	400	12	100	1.00
Washington:					
Bellingham	6	60	8	60	1.00
West Virginia:					
Huntington	3	2,000	6	50	1.00
Wisconsin:					
Janesville	6	100	10	100	1.00
Merrill	2	90 t	5	30 t	1.00
Wausau:					
Edmonton, Alta.	5 1/2	2,200	7 1/2	100	.75
Canada:					
Edmonton, Alta.	5 1/2	2,200	7 1/2	100	.75
Galt, Ont.	7	100 t	5	30 t	1.00
Lethbridge, Alta.	7	100 t	5	30 t	1.00
London, Ont.	7	100 t	5	30 t	1.00

a—City or residence rates. b—Suburban rates. c—Power rates. d—Business, general or commercial. e—Per h.p. f—Incandescent lighting. g—Arc lighting. h—Plus 30 cents for each kw. capacity over 3 of meter. i—Plus 75 cents per kw. above 1 1/2 kw. capacity. j—Price depends on time of day current is used. k—For 2 h.p. and under; add 50 cents for each additional h.p. l—During daylight hours only. m—No discount on minimum bills. n—Heating. o—Flat rate. p—For 50 h.p. motor. q—For 1 h.p. motor. r—1/2 cent reduction for each additional 50 kw. used. s—Price varies according to size of bill. t—Hours' use of connected load. u—For motion picture machines. v—Sign lighting. w—Domestic appliances in private houses.

TABLE 5—RATES FOR LIGHT AND POWER.

	Mini- rate, cents.	Min. amt. to which it applies k. w. h.	Max. amt. to which it applies k. w. h.	Discounts.	Minimum payment.
Alabama:					
Mobile	6 1/2	501	10	50	1.25
Arkansas:					
Fort Smith	1.99	10,000	12	100	1.00
Pine Bluff	6	500	5	50	1.00
California:					
Pasadena	3	2,000	5	100	.50h
San Angelo	1.2	3,000	4 1/2	100	1.00i
Colorado:					
Grand Junction	10	100	12 1/2	40	1.00e
Montrose	8	80	12 1/2	40	1.00e
Trinidad	5	120	4	100	1.00e
Connecticut:					
South Norwalk	5	500	9	100	.55
Stamford	9	500	12	100	1.11
Wallingford	6	150	8	50	1.00
Georgia:					
Thomasville	2 1/2	2,000	6 1/4	50	1.00k
Illinois:					
Litchfield	15	2,500	15	30	1.25
Indiana:					
Urbana	3	2,000	6	50	1.25
Anderson	2 1/4	2,500	3 3/5	250	.50
Iowa:					
Cedar Falls	5 1/2	116	11 1/2	16	1.00
Webster City	5	120	5	60	.50
Kansas:					
Coffeyville	1	120	10	50	2.00
Ottawa	2 1/2	400	7	200	1.00
Wichita	4	60	10	30	1.00
Kentucky:					
Henderson	5	116	11 1/2	16	1.00
Lexington	2 1/2	60	12	60	.50
Louisiana:					
New Iberia	8	101	12	30	1.00
Maryland:					
Baltimore	1 1/2	18,750	8 1/2	50	1.00
Massachusetts:					
Cambridge	2 1/2	5,500	10	23	.75
Boston	5	5,000	9	19	1.00
Concord	2 1/4	5,000	10	200	1.00
Fall River	1 1/2	62,500	15	500	1.00
Michigan:					
North Attleboro	11	10,000	8	201	.75
Reading	12 1/2	5,000	11	100	1.00
Taunton	9	3,000	6	100	.75
Minnesota:					
New Ulm	8	101	12	30	1.00
New Hampshire:					
Lebanon	10	101	12	30	1.00

(Continued from page 884.)

allike in system, and there are several entirely different theories upon which the different ones are based, it is impossible within the limits of a table to give all the minor variations, but with the aid of the foot notes we believe that a fairly good general idea can be obtained of each. For instance, in Mobile the city lighting rates are 6½ cents for more than 500 kw. hr. per month, with a sliding scale up to 10 cents where not more than 50 kw. hr. are used, with discounts of 3 cents from the maximum rate and 2 cents from each of the others; while for suburban lighting the minimum rate is 8 cents for all over 1,000 kw. hr., sliding to 14 cents for under 50 kw. hr., with 2-cent discounts in each case; the minimum bill rendered being \$1.25.

COST OF STREET LIGHTING.

The following is to be read in conjunction with Table 3. It shows what items are included in cost, or what services are rendered for the charge per year, for street lamps in various cities.

Bessemer, Ala.—Cost of installation, maintenance and current.

Mobile, Ala.—Street lighting all night.

Fort Smith, Ark.—Maintenance.

Little Rock, Ark.—Operating expenses and \$12 per lamp per year depreciation.

Pine Bluff, Ark.—Current, lamp renewals and first cost of equipment.

Grand Junction, Colo.—Maintain arcs and incandescents on an all-night schedule.

Montrose, Colo.—Current, maintenance and renewals.

So. Norwalk, Conn.—Maintenance, operation, interest and depreciation.

Stamford, Conn.—Construction, care and operation.

Wallingford, Conn.—Current, maintenance, lamp renewals, depreciation, etc.

Jacksonville, Fla.—City charges for current.

Tallahassee, Fla.—All regular operating expenses.

Griffin, Ga.—Current, labor, lamps, repairs and supplies.

Blue Island, Ill.—Arc lamp cost complete.

Canton, Ill.—Investment, meters, current and renewals.

Urbana, Ill.—Maintenance.

Bloomington, Ind.—Everything.

Crawfordsville, Ind.—All expenses.

Frankfort, Ind.—All items.

Peru, Ind.—All services are metered at switch board and a charge of 6c per kw. hr. is made.

Madison, Ind.—Installation and maintenance.

Coffeyville, Kansas.—Current and maintenance.

Ottawa, Kansas.—Everything is included.

Topeka, Kansas.—Operation, supplies, repairs, interest, depreciation, loss of taxes.

Wichita, Kansas.—Company maintains lines, renews, cleans and inspects lamps and extends lines for new lamps.

Baltimore, Md.—All maintenance costs.

Cambridge, Md.—Renewals.

Boston, Mass.—Company provides and sets lamp posts and furnishes lamps, overhead and underground equipment; all other necessary equipment.

Fall River, Mass.—Inspection of each lamp once every night, replacements and incidentals and a weekly inspection.

North Attleboro, Mass.—Interest, insurance and depreciation, including operating expenses at the plant.

Norwood, Mass.—Everything included.

Peabody, Mass.—Interest, depreciation and running expenses.

Pittsfield, Mass.—Everything.

Reading, Mass.—In outside towns, care of lamps, wires and poles and renewals of lamps is included; in Reading, maintenance only.

Springfield, Mass.—All items included.

Ypsilanti, Mich.—All operating and maintaining charges.

Lebanon, N. H.—All items included.

Hammononton, N. J.—Maintenance.

Orange, N. J.—Labor, current, depreciation, interest and insurance.

Kingston, N. Y.—Installation, operation and maintenance.

Saratoga Springs, N. Y.—Installation, maintenance and renewals.

Schenectady, N. Y.—All items included.

Gastonia, N. C.—All items included.

Columbus, O.—Gross cost, such as interest, taxes, etc.

Conneaut, O.—Cost of installing and maintaining.

Defiance, O.—Operation and general maintenance.

Niles, O.—Labor, power, renewals, line repairs and arc operating and maintenance expenses.

Sidney, O.—All renewals and maintenance.

Troy, O.—Labor, repairs, renewals and current.

Portland, Ore.—Current and trimming.

Connellsville, Pa.—Everything included.

Corry, Pa.—Maintenance.

Meadville, Pa.—All items but interest and depreciation.

Millvale, Pa.—Labor and installation.

Tyrone, Pa.—Operation and maintenance.

Waynesboro, Pa.—All items included.

Mitchell, S. D.—Current and maintenance of lamps.

Knoxville, Tenn.—Maintenance and operation.

Galveston, Texas.—Renewals and maintenance.

Burlington, Vt.—All items included, such as current, trimming, renewals, maintenance and all overhead.

Fredericksburg, Va.—Trimming, Care, renewals and globes.

Bellingham, Wash.—Installation and maintenance.

Merrill, Wis.—All maintenance and renewals.

Wausau, Wis.—Current only.

Edmonton, Alta.—Current and maintenance charges.

Lethbridge, Alta.—Cleaning, trimming, repairs, renewals, maintenance and overhead charges.

St. Catharines, Ont.—Renewals, maintenance and arc expenses, including 5 per cent depreciation and all capital charges.

NOTES ON WHITE WAY LIGHTING.

In connection with other questions which we asked of lighting officials was whether the ornamental or "white way" lighting in their business districts is "satisfactory to those immediately concerned." The following reported simply that it is: Bessemer and Dothan, Ala.; Fort Smith and Pine Bluff, Ark.; Pasadena, Cal.; Trinidad, Colo.; Jacksonville, Fla.; Washington, D. C.; Griffin, Ga.; Canton and Urbana, Ill.; Anderson, Bloomington, Crawfordsville, Frankfort, Linton, Marion, Portland and Valparaiso, Ind.; Cedar Falls and Webster City, Ia.; Coffeyville and Wichita, Kans.; Baltimore, Md.; Boston, Fall River, Norwood and Pittsfield, Mass.; Kalamazoo and Ypsilanti, Mich.; Crookston and New Ulm, Minn.; Hammononton and Newark, N. J.; Kingston, Oswego and Schenectady, N. Y.; Concord, Gastonia and High Point, N. C.; Bismarck, N. D.; Columbus, Defiance, Galion, Marietta, Niles and Troy, O.; Tyrone, Pa.; Rock Hill and Union, S. C.; Mitchell, S. D.; Knoxville, Tenn.; Norfolk, Va.; Bellingham, Wash.; Janesville, Marinette and Wausau, Wis.; Galt, Ont., Canada; Lethbridge, Alta, Canada. Topeka, Kansas, "finds very little complaint." The lighting is "moderately" satisfactory in Portland, Ore., and "apparently" so in Orangeburg, S. C.

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Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

JUNE 24, 1915.

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Private or Municipal Ownership.

One of the best and most favorably known of the municipal electric lighting plants of the country is that of South Norwalk (now the central part of Greater Norwalk), Connecticut. This plant began operation in 1892 under the superintendence of Albert E. Winchester, who is still its superintendent, and to whom belongs a very large part of the credit for its success. (The plant was described in our issue of February 6th, 1907.)

Mr. Winchester has studied municipal ownership of lighting plants in this country and in Europe, and appears to be as unbiased on the subject as could be expected of one who has for years been connected with either a municipal or a private plant. In a paper before the American Academy of Political and Social Science he makes the following statements:

Confiscation of rights that have been given by the public, accepted in good faith and honestly capitalized, with a reasonable expectation of a fair return for services properly rendered, is unjustified. Even if the service deteriorates, every possible effort to induce a remedy should be resorted to before public replacement is considered. Regulation is superior to revolution, but revolution certainly is an alternative, though a grave one of final resort.

Though it may be proven that a privately owned public utility has failed in its obligations to the extent that public ownership seems to be the only remedy, even then every reasonable means should be used to induce and aid the local concern to meet its just requirements. It is wiser to

patiently pursue a determination to improve existing methods, than to multiply public burdens and responsibilities unnecessarily; and only communities that can thus consider this matter are fit to be trusted with extended responsibilities.

That the author of the above is attempting to discourage municipal ownership because he does not believe it can succeed is disproved by the history of the plant of which he is superintendent. It began operating in 1892, and 21 years later every dollar invested in it—about \$205,000—had been paid back from the net profits from commercial sales; and during 1914 it paid from its profits dividends into the public treasury equal to \$1 per capita of the population supplied; and from its reserve funds loans money to the city without interest. The city pays it for lighting the streets on a basis of actual cost, and is thus saved considerable in its expenditures for this purpose.

In general, Mr. Winchester would apparently advise a city where there is already a private lighting plant to let it occupy the field uncontested so long as it gives good service at fair rates; if the service becomes poor or the rates apparently excessive, to use every method of persuasion, including the public utility commission, to endeavor to obtain satisfaction from the company; and only when this is found impossible, to resort to a municipal plant. What his advice would be to a town in which there is no plant, private or municipal, is not so clearly stated; but we believe it would be to adopt municipal ownership if favorable terms could not be made with a private company, and if the project could be "protected from politics, that arch defiler of all kinds of public utilities, regardless of ownership—public or private." At any rate, he has demonstrated that under the right conditions municipal ownership can be highly successful, and cites the fact that there are now more than 1,600 municipally owned lighting plants.

Spacing Lights on Residence Streets.

It has been a common statement in the past that, for residence streets or others where a high degree of illumination was not wanted or could not be afforded, the most desirable result was as uniform a distribution as possible of the low illumination which was to be secured by the use of frequent lamps of low candle-power. In an article in this issue, however, an illumination expert states that this idea can be carried too far, and that uniform illumination is not desirable where it is not fairly brilliant; but that objects on road or sidewalk which are not brightly illuminated are more noticeable if the light strikes them from one direction only and they cast a shadow, or, themselves dark, are silhouetted against a background of lighter roadway.

But even this reason is overshadowed, where the presence of numerous shade trees prevent a lamp from throwing its light for any considerable distance along the street, by the fact that unless the lamps are numerous on such a street there would be only spots of light along the roadway or sidewalk, no matter what the candle-power of the lamp or angle of its maximum illumination. Where there are shade trees, therefore, the lamps should be numerous, or should be located over the center of the roadway where they could be placed reasonably high above the surface without the foliage interfering.

Another objection to bright lights widely spaced in a residence district is the annoyance to those whose houses the lights are placed in front of, caused by their shining all night into bedroom windows. It would seem possible, however, to remedy this with little trouble by fixing small shades (which could also be reflectors) in line between the lamp and the windows where the light is objectionable.

The WEEK'S NEWS

Highway Department Reorganization in Pennsylvania—Kansas Dirt Roads—Galveston's Sanitary Survey—State Regulation of Metering in California and West Virginia—The Wanaque Supply—Cities Win New Jersey Rate Case—Valuation of Cincinnati's Light Plant—Salem Fire Relief Committee's Work—Election Results in Portland, Ore., Springfield, Mo., and Bridgeport—Philadelphia's Clean-Up and Cincinnati's Street Cleaning Costs—End of Great Chicago Strike—Philadelphia Housing Bill Signed.

ROADS AND PAVEMENTS

Changes in Pennsylvania Highway Organization.

Harrisburg, Pa.—To effect an annual saving of more than \$40,000, the state highway department has inaugurated a system which will enable the county superintendents to keep a closer watch on the work being done in their districts. By the dismissal of eighty general foremen, whose individual salaries were \$85 a month and whose expenses averaged \$15 a month, the sum of \$8,000 a month is saved. These men worked for eight months in a year, consequently the total cost of their salaries and expenses to the state highway department was \$64,000. By the purchase of auto runabouts, with wagonette bodies, for the use of the county superintendents, it will be possible for each superintendent to look after personally the work formerly done by the general foremen, who have been dismissed. Ten runabouts have been purchased to test the efficacy of this plan and four of these ten have been delivered. The wagonette body gives room to carry tools in the rear. The purchase price of each runabout is \$440 with \$25 added for freight, making the total cost to the department \$465. If, ultimately, fifty of these cars are purchased for the use of the superintendents, the total cost will be \$23,250, which, subtracted from the \$64,000 saved in salaries and expenses of general foremen, leaves a balance in favor of the department of \$40,750. Chief Engineer Uhler figures that the present travelling expenses of the county superintendents, who, in many cases, are compelled to hire teams to take them over their districts, will more than pay for the operation and up-keep of the runabouts. But even more important than this is the increased efficiency of the working force which will be gained. To prevent any possibility of the misuse of these cars and of others belonging to the state highway department, each car will be marked.

Reject St. Louis Parkway Scheme.

St. Louis, Mo.—The Central Traffic Parkway project was defeated by a majority of 10,529 votes. The vote was the lightest cast in St. Louis in many years, being but 75,163 in the twenty-eight wards, when the registration is about 146,000. The vote for the parkway was 32,317, and against it, 42,846. James C. Jones, chairman of the citizens' parkway committee, which actively campaigned for the project, announced that the committee will not be disbanded, but that a campaign of education will begin, with a view to securing adoption of the improvement later. The proposition carried in five of the twenty-eight wards. Mayor Kiel promised the voters that if after the board of assessors ascertained the value of the property selected for condemnation it was found the proposition would cost in excess of \$10,000,000, the improvement would be abandoned. The opponents contended the improvement would place an excessive burden of taxation on property-holders in the improved district and also throughout North and South St. Louis.

Dirt Roads in Kansas.

Topeka, Kan.—With efficient use of the revenue from the state automobile license fund this year, Kansas will establish the best system of dirt roads in the United States, declares J. T. Botkin, secretary of state. The 105 county treasuries will receive \$270,000 from the fund at the close of the year ending June 30. The money realized by the state from its automobile license fund goes directly into the counties where the machines are owned after deducting the small expense for handling the work in the secretary of state's office. Seventy-five cents from each automobile license is deducted to meet office expense, postage and pur-

chase of tags. Fifty cents is deducted from the motorcycle license, leaving \$4.25 to be returned to the county in which the automobile is located and \$1.50 from each motorcycle license. Under the law, none of the money from the automobile license fund can be used to build new roads or bridges. All of the money must be spent on designated county highways. It is estimated that the fund from the sale of automobile licenses during the last year will permit from five to seven draggings of every designated highway in the state.

Cement Manufacturers to Build Road.

Harrisburg, Pa.—The cement industries of eastern Pennsylvania and public-spirited citizens in Lehigh and Northampton counties have entered into an agreement with the state highway department to furnish sufficient cement to build a road twelve miles in length, running from Allentown to Bethlehem and continuing to Easton. According to the estimates of the state highway department, this will require upwards of 40,000 barrels of cement. Plans are under way also to have these citizens furnish, in addition, the amount of stone which will be necessary to construct this improved highway. A conference was held in the office of State Highway Commissioner Cunningham at which Col. H. E. Trexler, Congressman H. J. Steele, H. R. Fehr, president of the Lehigh Valley Transit Company, G. S. Brown, president of the Alpha Portland Cement Company, William B. Myers, representing the Bethlehem Steel Company, and Senator Horace W. Schantz presented the offer of the Associated Cement Companies and the citizens of that district. The proposition was made that the state highway department do the necessary grading and pay the expenses of such engineering changes as might be necessary and build the road. The Lehigh Valley Transit Company pledged itself to furnish \$1,000 worth of transportation for the freighting of the cement.

May Pave Irregular Highway.

St. Joseph, Mo.—The decision in the Independence highway case which was appealed to the Kansas City court of appeals upholds the city in all its contentions. This suit concerned a highway, the improvement of which was claimed to be unlawful because the street was not a continuous straight line, but had three right angles in it. The court held that the topography of the country called for such a thoroughfare, and that long continued use had made it a definite highway and designated in the ordinance calling for the improvement. The plaintiff was owner of two lots along the route.

SEWERAGE AND SANITATION

Galveston's Sanitary Survey.

Galveston, Tex.—Systematic arrangements are being made for the city's part of the sanitary survey to be made in connection with the joint rat survey recently inaugurated in Galveston by the city and state health departments. As a result of this sanitary survey the Galveston health department will inaugurate a card system of "keeping tab" on all premises in the city. The individual blanks to be used by the city inspectors in recording the results of the sanitary survey, are prepared by Dr. Walter Kleberg, city health officer. Under the head of "general notes" the name of the owner of each dwelling or other structure, as well as the name of the tenant, will appear, followed by minute descriptions of the lot and of the building. Blanks are to be filled in answering many questions pertaining to conditions of the building, the manner of maintaining it—for instance,

whether it is screened, or has rat runs or harbors, how many water closets if any, whether the house is raised, and how much ventilation, whether there have been any infectious diseases in the house and various other details. Under another heading "surroundings" will be taken up. In this division of questions the sanitary survey will bring out information relative to all pertinent features of the entire premises, including yard if any, stable, chicken or pig pen, garbage, street and alley. The matters of sewerage, whether lawns and flower beds are properly maintained, the condition of stables and other outbuildings and their relations to the dwelling or other principal building, drainage, disposition of garbage, character and condition of streets, gutters and alleys are among those to be the subjects of data resulting from the survey, which, when finally completed, undoubtedly will prove a valuable asset to the department. Dr. Kleberg announces that he has no immediate plans for a special clean-up campaign, as, he states, the city is now reasonably clean, though he plans to inaugurate such a campaign probably next fall.

School for Health Officials.

Austin, Tex.—The Texas state board of health announces that the University of Texas has consented to establish a summer school for the benefit of the county and city health officers of the state as well as all other physicians and teachers of the state who will attend. The term will be three weeks, beginning June 14, 1915. The program will be as elaborate as can be made in this period of time, consisting of lectures on municipal health, organization and administration of public health, public health laws, vital statistics, anti-narcotic law, both state and federal, human carriers of disease, epidemiology, purification of water supplies, plumbing and sewers, septic tanks and incinerators, vaccination, rabies and its treatment, infant feeding, baby welfare, sex hygiene, clinical laboratory and its work, method of collecting specimens for bacteriologist, soil pollution, laboratory diagnosis, medical supervision in public schools, serums and bacterines, rural homes, school hygiene and sanitation, rural health problems, and pure food. At the close of each day's session there will be round table talk upon subjects lectured on during the day, or any other subjects chosen by those attending these lectures. There will be no fees charged for this summer health course by the university, and the board of health asks the county and city governments of each county and city to provide sufficient funds for their respective health officers to attend this meeting.

Pennsylvania's Health Exhibit Wins at Exposition.

Harrisburg, Pa.—The Panama-Pacific exposition has awarded the grand prize for department of health to Pennsylvania, with special mention for Dr. Samuel G. Dixon, the state health commissioner, according to announcement by Chester P. Ray, who is one of those in charge of the state's exhibit at San Francisco. The exposition award places Pennsylvania foremost among the states of the Union in the fight against tuberculosis and disease generally. Prior to this, the federal government had selected Pennsylvania to demonstrate to the world through the exposition how the \$20,000,000 used each year by the various states in the fight against tuberculosis can be best expended. Pennsylvania's exhibit at San Francisco, arranged under the personal supervision of Dr. Dixon, cost, approximately, \$20,000. It covers 9,000 square feet and is replete with novel attractions. Plaster of paris relief maps and models portray in miniature the great state tuberculosis hospitals at Mont Alto, Hamburg and Cresson. How the department blotted out an epidemic of typhoid fever at Scranton is shown in a big relief map of that city, an important feature of the exhibit. Nurses give daily popular talks on the care of children, the care of the home and other health topics. The exhibit includes hundreds of photographs. Large quantities of literature on health are on display. The exhibit was made in Philadelphia and took two freight cars to haul it west. Miss Alice M. O'Halloran, chief nurse in the state department of health, accompanied it and is one of those in charge of it now.

WATER SUPPLY

State Regulation of Meters.

Sacramento, Cal.—"Creeping" meters are to be abolished in California. State Superintendent of Weights and Measures Charles G. Johnson is formulating a plan whereby light, power and gas meters in California will be tested and adjusted to register accurately. This brings the various light and power companies of the state within the jurisdiction of the weights and measures act of the state, and makes it possible to confiscate faulty meters and destroy them, as is done with other weighing and measuring apparatus.

State-Wide Metering.

Charleston, W. Va.—The public service commission is preparing a set of rules for the regulation of the rate systems of electric light, gas and water companies in West Virginia, which practically will require them to abandon the flat rate and install the meter system. Before such rules can be put into effect, however, the commission will hear all the objections and suggestions of representatives of these public utilities. A committee of the State Public Utilities Association met in Charleston and conferred with the commission.

More Cities Want Wanaque Supply.

Trenton, N. J.—Jersey City has also asked to be considered in the Wanaque plan. Commissioner George F. Brensinger told the commission that Jersey City would probably need an additional supply of water if the plan to consolidate the Hudson towns was carried out in the near future. The daily capacity of the present reservoirs which store the supply developed at Boonton is 50,000,000 gallons. The city has actually used that quantity at some periods, but just now is consuming about 47,000,000 to 49,000,000 gallons daily. Jersey City has a protective contract with the New York and New Jersey Water Company. Morris R. Sherrerd, engineer of the commission, suggested that Jersey City could obtain water from the Wanaque watershed through its pipe line that now passes through Belleville. The engineer pointed out that the prospect of getting water in this way within four or five years would enable Jersey City to postpone incurring the expense of building additional pipe lines to Boonton or increasing its storage capacity there.

There is a possibility that Essex municipalities not hitherto considered may want Wanaque water. West Orange is looking forward to new sources now. Its contract with the West Orange Water Company expires in 1918 and its representatives have been talking to the state commission about the prospect of getting a new supply from the Wanaque. Elizabeth put up more money than any other municipality for the Wanaque survey, but the commission has heard nothing officially that would indicate what attitude it will take on the development plans.

Rates Changed in Syracuse.

Syracuse, N. Y.—A readjustment of rates for city water has been worked out by Superintendent Charles A. Windholz of the Bureau of Water, and will go into effect July 1. The features of the new schedule are that householders will be charged less and large consumers will be charged more, and a return to the yearly allowance of 3,600 cubic feet as the maximum without additional charge for small users. To arrive at a basis of readjustment more than 38,000 accounts on the bureau books for 1913 and an equal number for 1914 were analyzed and compared. This disclosed some interesting facts. It was found that in 1913 the householders consumed 23 per cent of the water and paid 51 per cent of the revenue; that stores, manufacturers and others consumed 17 per cent and paid 19 per cent, and that large manufacturers, hotels, etc., consumed 60 per cent of the water and paid only 20 per cent of the bureau revenues. In 1914, when the amount of water allowed was increased from 3,600 to 4,200, about the same relative proportions were maintained. The large consumer pays 3½ cents, while the householder pays 12 cents for 100 cubic feet of water. Mr. Windholz proposes 4½ and 11 cents as the new rates. Monthly meter rates, in cubic feet, follow:

2,200 or less, 12 cents per 100.
 2,300 to 2,400 inclusive, lump sum, \$2.64.
 2,400 to 6,000 inclusive, 11 cents per 100.
 6,000 to 8,300 inclusive, lump sum, \$6.60.
 8,300 to 14,400 inclusive, 8 cents per 100.
 14,400 to 17,700 inclusive, lump sum, \$11.50.
 17,700 to 21,000 inclusive, 6½ cents per 100.
 21,000 to 27,300 inclusive, lump sum, \$13.65.
 27,300 to 40,000 inclusive, 5 cents per 100.
 40,000 to 57,100 inclusive, lump sum, \$20.
 57,100 and up, 3½ cents per 100.

Of forty-one cities with a population of from 100,000 to 300,000, Mr. Windholz finds, only three have as low a rate for manufacturers as Syracuse, while the larger number charge 7½ cents. He believes that a readjustment will result in a more equitable distribution of water cost. In 1914 there were 34,039 families served and 18,475 used less than the yearly allowance of 4,200 cubic feet for \$5 a year. The new allowance will be 3,600 cubic feet for \$4. At the rate of consumption for 1913, he says, the maximum of 27,000,000 gallons a day will be reached when the population is 185,000. In 1913 the rate was 146 gallons a day for each individual. He believes that it should not exceed 115 gallons. With this lower rate the present conduits would supply a population of 230,000, or 80,000 more than at present. The administration, he says, will lead off in water economy by equipping all public buildings with meters and comparing the consumption. He regards the city as one of the worst offenders in water waste, and says it should set the example of economy.

Waterworks Profits May Be Generally Used.

Columbus, O.—Attorney General Turner, in a ruling to the state bureau of accounting, held that profits from municipally-owned waterworks in charter cities may be used for general municipal purposes outside waterworks needs alone. Turner's ruling opens the way for city use of big waterworks surpluses in several Ohio cities. The fact that a city owned plant has excess revenues is no reason why it should be compelled to lower water rentals charged consumers, Turner held. "It has not been the policy of the state to limit rates strictly to such revenues as might pay mere operating expenses and bond and interest charges of city-owned waterworks plants." Turner's opinion was based on a query concerning the Dayton charter.

Water Waste in Pittsfield.

Pittsfield, Mass.—Pittsfield consumed an average of 5,900,000 gallons of water daily during May. Flushing of hydrants added to the consumption, but figuring that 100 gallons of water should be used daily by each of the city's 35,000 inhabitants, the total would be only 3,500,000 gallons. A canvass is being made by inspectors to determine whether there are leaks in pipes and faucets which waste water and when it is finished it is asserted there will be a drop in the average daily consumption—that June's consumption will be much smaller than in May. There is, however, plenty of water on hand in the supply system.

City Loses Water Rights Decision

Paterson, N. J.—An order of the supreme court at Trenton allowing the appointment of commissioners to condemn water rights wanted by the West Orange Water Company in the Passaic river, which was fought by the city of Paterson, has been affirmed by the court of errors. The city contested the issue on the ground that the West Orange concern had no right to condemn waters that flowed in the Passaic river through its municipal parks. It is stated in the opinion that the company tried to buy water rights from the city, but that it failed in the efforts. The company wasted an average quantity of 1,000,000 gallons of water per day. It was contended by the city of Paterson, that the water company did not have the right of eminent domain for the purpose which it sought, and if it did have that power it could only be exercised in the neighborhood of West Orange; and that Little Falls, where the company wanted to take the matter, is not within the area to which it is entitled. The opinion states that under the act of 1876, the company is clothed with the right of eminent domain, so far as it refers to the getting of the water supply for West Orange and its inhabitants.

New Reservoir Added to Bridgeport Supply.

Bridgeport, Conn.—The supply from the new Hemlock reservoir has been turned into the city system through the new 48-inch main and the pressure all over the city was increased 20 pounds. The Bridgeport Hydraulic Company has been building the new reservoir at Easton for several years and it was completed last fall. It gets its supply of water from the Aspetuck river. The storage reservoir is three miles long, averages half a mile wide and is over 90 feet at the deepest place. It has a capacity of 4,500,000,000 gallons.

STREET LIGHTING AND POWER

Cities Win Jersey Rate Case.

Trenton, N. J.—The court of errors and appeals by a vote of six to four, has reversed its own decision of six months ago and upheld the action of the supreme court in sustaining the state board of public utility commissioners' order requiring the Public Service Gas Company to fix ninety cents per thousand cubic feet as the price to be charged by the Public Service Gas Company in the Passaic division. The opinion is of importance wherever the company operates for, following the board's order, the rate was made effective in all districts. More than four years of litigation are ended by the decision and the result is in reality a recall of judicial opinion. The decision is one of the most remarkable in the history of the Jersey courts. It is of national significance in that it affirms the system of governmental regulation of public utilities, which had been jeopardized by the first decision curtailing the powers of the state's regulating agency. The first movement for the cheaper rate began in Paterson. A complaint was brought to the utility board, which refused the request of the city for an 80-cent rate, refused the request of the company for a \$1 rate and allowed a 90-cent rate. The city appealed because the rate was too high and the company because it claimed it was too low. The supreme court sustained the board and the court of errors reversed both the supreme court and the board. Bitter criticism was centered upon members of the court of errors, and the agitation finally resulted in an application for a rehearing, which was accompanied by a demand for the disqualification of Justice Heppenheimer as a member of the court on the ground that he had personal interests at stake in the litigation. The court refused to disqualify Justice Heppenheimer, but he voluntarily retired. One of the most important principles enunciated by the court of errors and appeals in the opinion of Justice Parker reversing the decision of the supreme court was that secondary franchises should be given a substantial value as a basis for rate fixing. This opinion was the cause of state-wide indignation. It has been announced that the company is to appeal.

Valuation of Cincinnati's Lighting Plant.

Cincinnati, O.—Cutting \$12,331,140 from the valuation of the electric lighting plant and equipment of the Union Gas & Electric Company of Cincinnati as appraised by the company's engineers and experts, the public utilities commission at Columbus announced that it has tentatively appraised this property for rate making purposes at \$8,718,541. The company's valuation was \$21,049,681. This included \$5,581,600 as the value of its franchise from the city, \$2,550,263 for the cost of financing, \$2,716,765 for the cost of developing its business and \$226,852 for working capital. Its physical property the company values at \$9,974,201. In striking from the company's estimates the five and a half million dollar franchise item, cutting down the "cost of financing" to \$241,305, limiting the amount allowed for "developing business" to \$312,000, and reducing working capital to \$110,108, the public utilities commission establishes a policy for valuing public service corporations to determine rates which is of great importance not alone to Cincinnati, but to the entire state. The commission's action will probably foreshadow big reductions in the valuations of the Cincinnati Traction Company and other utilities being appraised by the commission's experts. Thirty days is allowed the Cincinnati Union Gas & Electric Company for filing protests against the commission's tentative figures.

Unless it can convince at least two of the commission members that the commission's estimates are wrong, the tentative figures become final and the company's only recourse is to the courts. The table shows the intangible items in the Union Gas & Electric Company's valuation of its electric lighting plant either eliminated or cut down by the public utilities commission in fixing the tentative valuation:

	Com- pany's Valuation.	Com- mission Valuation.
Value of franchise.....	\$5,581,600	\$.....
Cost of financing and organizing business.....	2,550,263	241,305
Cost of developing business.....	2,716,785	312,000
Working capital.....	226,852	110,108
Totals.....	\$11,075,500	\$663,413

The utilities commission began its work of appraising the Cincinnati lighting plant last August and has been at it since with a corps of engineers and appraisers under Chief Engineer L. G. White.

Street Lighting Cost.

Joplin, Mo.—That street lights cost the city \$11,910.56 last year or \$31.59 an arc is the report of Charles A. Patterson, commissioner of public property and public utilities. Mr. Patterson figures the cost of each arc per month at \$2.63. The receipts of the light plant for current were \$15,476.99 and the expenditures totaled \$27,387.55. The difference between the expenditures and the receipts is figured as the cost of maintaining the city lights.

FIRE AND POLICE

\$300,000 Fire Threatens New City Docks.

Portland, Ore.—Fire swept more than four blocks of property on the east side waterfront, doing damage estimated at \$300,000 and threatening the new municipal docks and the Burnside bridge. Good work was put in by the fireboats David Campbell and George H. Williams, which saved the dock. Fire Chief Dowell was in charge.

Report of Salem Fire Relief Committee.

Salem, Mass.—The last chapter in the story of the Salem fire is the publication by the Salem fire relief committee of the report of the audit made by Clinton H. Scovell & Co., of Boston, of the committee's accounts from June 26, 1914, to May 12, 1915, the date of the final meeting of the committee. Total receipts were \$735,810.01, of which \$632,411.34 were cash donations, \$100,000 came from the commonwealth and \$3,398.67 was derived as interest on bank balances. Payments to individuals, firms and corporations totaled \$605,743.62 and to the Salem rebuilding trust \$100,000, leaving May 12 a cash balance of \$30,085.39, turned over to the Salem commissioners of trust funds. The latter have claims also for \$5,251.50 against the commonwealth for rations supplied the state militia and for \$2,315.15 against fire sufferers for loans made. Of the \$605,724.62 above mentioned, the largest item was \$308,691.38 for furniture, clothing and sundry rehabilitation. Other considerable items were: Cash to fire sufferers, \$36,081.15; business rehabilitation, \$32,494.15; employment of fire sufferers, \$55,616.22; food distribution by militia, \$18,301.32; food distribution by food supply committee, \$28,030.55; food distribution by grocers, \$26,562.12. Of the total, \$79,168.59 was handled by the rehabilitation committee and \$32,504.04 by the refugees' labor committee. The auditors express approval of the business methods of the relief committee and its subordinate committees, finding that payments were made only with authority and were duly accounted for and that the system in use at the purchasing department and at the storehouse was properly carried out. The committee calls attention to the low proportion of cost of administration.

Work of Middletown, N. Y., Department.

Middletown, N. Y.—In his annual report for the year ending April 30, Chief Charles Higham states that the estimated loss by fire for the year covered by the report is \$11,777.64 as against \$17,644.07 for the preceding year, and one of the lowest in losses in many years. On the above estimated loss the amount of insurance paid was \$11,487.84. The department responded to 63 calls during the year, of

which 29 were box alarms and 34 still or telephone alarms. The department at present consists of one chief engineer and two assistant engineers, 303 active members and a total of 1,091 active, active honorary and honorary members. The city owns 6,600 feet of hose, of which 4,000 feet are in good condition, and 2,200 feet are in fair condition, and 400 feet in worthless condition. The total amount of chemicals used during the year by the department was 632 gallons. The amount of work performed at fires during the year occupied 45 hours and 36 minutes. The department laid 20,950 feet of hose for the use of fires during the year where water was used. The figures compiled by the city clerk show that the cost of the maintenance of the department for the past year amounted to \$20,175.35. The department now has in service the following apparatus:

One three-horse hitch hook and ladder truck carrying a full equipment and 325 feet of ladders; one two-horse double tank combination chemical and hose, capacity 70 gallons of chemical and 800 feet 2½-inch hose and a full equipment; one one-horse hose wagon carrying 600 feet 2½-inch hose and a full equipment; one automobile double combination consisting of one pump, capacity 500 gallons per minute and 650 feet 2½-inch hose with a full equipment; one automobile triple combination consisting of one 35-gallon chemical tank, one pump, capacity of 800 gallons per minute, and 1,000 feet 2½-inch hose with a full equipment; on automobile triple combination consisting of one 40-gallon chemical tank, one pump, with a capacity of 1,000 gallons per minute and 1,000 feet 2½-inch hose and with a full equipment; one hand hose cart with a capacity of 700 feet of 2½-inch hose; one chief's automobile.

MOTOR VEHICLES

Proposed Motorization of Fall River.

Fall River, Mass.—The tentative proposition of the fire commission providing for the complete motorization of the department, at an outlay of approximately \$100,000, is being considered by the aldermanic committee on finance. Under this plan, five motor pumping engines, four hook and ladder trucks and four combination hose and chemical wagons would comprise the additional equipment. Besides increasing the working force by 20 per cent, while obviating the necessity of employing 10 additional firemen, this arrangement would permit of an annual saving of \$28,000. Another important feature of the plan under consideration by the fire commission would be the abandonment of the call force. At present, 15 callmen are in the service and they are paid at the rate of \$150 each per annum. Of the 44 horses to be thrown out of the service 40 would bring \$150 each, representing \$6,000. The upkeep for horses, figured at \$300 each per annum, represents an annual item of \$13,200 that would be saved. The upkeep for automobiles, based on a rate of \$150 each for 15 machines, making \$2,250, has been deducted and shows a net saving of \$10,950. The other big saving would come in the salaries of 10 additional men. The three following propositions are to be considered: The cost of changing over the present apparatus and using tractors and the bodies of hose and chemical wagons; the cost of motorizing the department completely with a type of machine considered low-priced; the cost of motorizing the department with the best type of machine.

New Auto for Sanitation Department.

Lawrence, Mass.—The new auto truck, recently put into service of the sanitation department of the health department, made an experimental trip through a section of the city and Superintendent D. J. Murphy, of the department, is highly pleased with its success. All the ashes in that section of the city were cleaned up in a few hours and the truck, carrying a load of about five tons, made all the hills without difficulty. The city council sanctioned a recommendation of Alderman Maloney and his superintendent some time ago to add additional trucks in the sanitation department.

Patrol City by Autos.

Detroit, Mich.—Beginning July 1 each of the three police districts in the city will be patrolled by officers in automobiles 16 hours out of the 24, in addition to the regular

officers on duty. An automobile will be placed in each district for the use of the inspector on duty and he is supposed to go thoroughly through his district. When the inspector leaves one end of the district a sergeant and a uniformed patrolman will leave the other end in another car and patrol the district. The inspector, sergeant and patrolman will do free lance duty in their respective districts. It was originally planned to have a car for each of the police stations to be used by the plainclothesmen, but the estimators cut out a number of the cars requested.

GOVERNMENT AND FINANCE

Portland, Ore., Election Results.

Portland, Ore.—At the recent election the following voting resulted on measures submitted. Three measures were defeated and seven approved. The defeated were: Water meters, 15,820 to 19,483; Sunday closing of groceries, 10,578 to 23,545; municipal garbage collection system, 13,186 to 20,507. The measures approved were: Changes in civil service, 17,654 to 9,772; grade crossing proceedings, 20,253 to 8,176; transfer of pound to Humane Society, 19,953 to 11,600; jitney regulation, 22,115 to 14,284; payment of street assessments semi-annually, 17,165 to 11,302; pensions to two disabled firemen, 20,920 to 10,080; firestops for the waterfront, 19,246 to 11,176. The two suburbs of St. Johns and territory were annexed. The commissioner of public utilities wished authority to purchase 5,000 meters, but the proposition met with defeat as did also the proposition of a new garbage system.

Commission Victory May Be Illegal.

Springfield, Mo.—A proposition to adopt the commission form of municipal government carried at a special election, the vote being 1,938 for and 1,166 against. At two previous elections during the last two years a similar proposition was defeated. Opponents of the commission form declare the election was illegal because there had been no registration for it. Frank B. Williams, city councillor, has declared the election invalid. Another election will be held.

Newcastle Mayor Acquitted.

Newcastle, Ind.—Mayor James Leb Watkins has been acquitted of the charge of malconduct in office, which had been returned by a grand jury several weeks ago. Included in the charges were those of accepting bribes from operators of "blind tigers" and gambling games.

Commissioners Not to Be Recalled.

Wildwood, N. J.—The Supreme Court has dismissed the rule of mandamus to compel the city clerk of Wildwood to submit to the people of the town the petition for the recall of three commissioners of Wildwood. The proceedings were instituted against City Clerk James E. Whitesell. The first petition for the recall of the commissioners was filed December 12, 1913. The city clerk declared this petition insufficient and a new one was filed May 14, 1915. This was also declared insufficient. Nothing was done about it, however, until February 2, 1915, nine months later, when the writ of mandamus was sued out. The court in dismissing the writ said that when a person seeks to oust commissioners and have an election held for their successors he should move more speedily. The matter ought not to be left uncertain for a time nearly equal to one-quarter of the whole term of the officer, the court held.

New Charter Signed.

Stamford, Conn.—Governor Holcomb has signed his approval of the revised city charter of Stamford. The instrument goes into effect immediately. One of the most important changes is that which abolishes the offices of superintendent of public works and city engineer, so far as their present status is concerned. The duties now performed by those holding these offices are to be performed by an officer to be known as the city engineer, who will be similar to the present superintendent of public works, in essential respects, and who will also be responsible for such duties as are now performed by the city engineer. He is to appoint a deputy and is to have control over and be responsible for the staff attached to his office. The new city engineer is to be named within sixty days, and the assistant within ninety days. The

office of city auditor is to be abolished in January, 1917, at the expiration of the term of the incumbent. Instead, the council is to employ a certified accountant to make a thorough audit, once in six months, of all city accounts. Suggestions made by physicians and others have been incorporated in the sections relating to the Board of Health. One of these provides for the appointment of a city bacteriologist, whose term of office is two years. The two assistant chiefs of the fire department are abolished, and in their stead will be a deputy chief—a "permanent" man.

Bridgeport Votes for Commission Government.

Bridgeport, Conn.—At a special election which drew out a light vote this city has decided in favor of the commission form of government and indicated its preference for a five commissioner plan and against a city manager form. At the election bonds were voted for the municipal ice plant and two bridges but the bond issue for a garbage incinerator was defeated as were also the grade school bonds. The voting was as follows: Commission form, 4,173 to 2,006; five-commissioner plan, 3,406 to 2,005; city manager plan, 796 to 3,647; Grand Street Bridge bonds, 3,608 to 1,932; E. Washington Avenue Bridge bonds, 2,910 to 2,015; garbage incinerator bonds, 1,762 to 2,729; municipal ice plant bonds, 3,538 to 1,659 and grade school bonds, 1,962 to 2,640. The Commission Government League is now considering the best way to prepare the new charter under the Home Rule act which goes into effect August 1. The mayor has promised to expedite the process of drafting the new charter.

STREET CLEANING AND REFUSE DISPOSAL

Cost of Philadelphia's Clean-Up.

Philadelphia, Pa.—Complete reports from all districts show that the city in its annual assault upon dirt and filth during the "Clean-up Week" removed 108,000 cubic yards of rubbish of all descriptions. The total cost of collecting and removing this material was \$12,075. In every department of the "clean-up week" campaign an increase in the work of the crusade over the past three years was recorded, according to a report made by Chiet Connell of the Bureau of Highways. During the past week 1,825 extra teams and 900 extra helpers were engaged, an increase in teams over last year of 600 and in men of 200. The record of extra loads removed show 10,800 loads for 1915 as against 8,575 loads for 1914. The increase in cubic yards totaled 18,000. If the total cost to the city of removing the rubbish and debris placed outside homes and establishments were divided among the city's population, each resident of this city would pay seven-tenths of a cent. The unit cost of cleaning up 129 square miles of city territory was \$93.50.

Cost of Cleaning Cincinnati's Streets.

Cincinnati, O.—Street Superintendent Frederick Maag has just presented his report for 1914 to Service Director Fosdick. Finding that he was to work with funds more than \$32,000 short of the sum allowed the previous year, Superintendent Maag merged the services of removing debris and ashes, saving \$23,477.50. He reduced the payroll \$46,217.96, but he expended the bigger part of these savings for horses, wheels, hose and feed. The laying off of a number of supervisors saved nearly \$15,000. He flushed 66,571 more squares than was done the year before. He cleaned 24,293 more square yards of streets than the year before, at a saving of \$11,875.69.

Garbage Collectors' Strike Ended.

Schenectady, N. Y.—The garbage and ash collectors are now at work after a strike lasting about a week. A conference was held with Superintendent McMahon, representing the contractor, M. F. Dollard. The strikers won an increase of eight cents per day on their wages, that is, to \$14 per week. It was decided to "rotate" the men by allowing each man to lay off one week in every three or four in order to give other men a chance. They formerly received \$2.50 a day, but under the contract system receive but \$2.25. The strike had been called in an endeavor to force the contractor to restore the old wage.

RAPID TRANSIT

Chicago Strike Ended.

Chicago, Ill.—The great traction strike, which tied up the whole city and dislocated every activity for 53 hours, is over. Mayor W. H. Thompson is given credit for this victory of arbitration—he held the traction company officials and the union leaders in his office for fifteen hours in a night-session behind closed doors until they agreed to arbitration and an arbitrator. A temporary agreement was signed to be in force until the board of arbitration gives its verdict. Following list upon list of names for the third arbitrator to be chosen by both sides, both accepted Mayor Thompson. The following were in the conference:

Mayor William Hale Thompson, Alderman Henry D. Capitain, chairman of the aldermanic "peace" committee, Alderman James H. Lawley, Alderman John A. Richert, Alderman William J. Healy, Alderman Willis O. Nance, Leonard A. Busby, president of the Chicago surface lines; Britton I. Budd, president of the Chicago Elevated Railways; Henry A. Blair, chairman of the board of operation of the surface lines; William D. Mahon, international president of the car men's organization; William Taber, secretary surface lines union; William Quinlan, president of the surface lines union; Edward McMorro, general executive committeeman, surface lines union; L. D. Bland, editor of the Union Leader, the car men's official organ; John J. Bruce, president of the elevated men's union; Maurice Lynch, assistant secretary surface lines union; W. S. McClenathan, secretary of the elevated men's union and vice-president of their international association; James A. Pugh, Charles C. Fitzmorris, the mayor's secretary.

The arbitrators finally chosen were State Attorney MacLay Hoyne for the men, James M. Sheehan for the companies and Mayor Thompson as umpire.

Municipal Jitney Regulation in Pennsylvania.

Pittsburgh, Pa.—Governor Brumbaugh, recognizing the jitney bus as a vital factor in rapid transit in the cities, has interposed his veto to safeguard against hastily-devised legislation. He has vetoed the house bill that would empower street railway companies to operate jitney services. He has signed the bill giving cities authority to pass ordinances to regulate jitneys.

Cleveland's One-Cent Car Line.

Cleveland, O.—Cleveland's new one-cent car line, which operates from the public square to the East Ninth street pier, made \$57 the first Sunday. The regular day service will be a car every fifteen minutes. From 6.30 to 8.30 a. m., time of arrival of boats, and 7.30 to 9.30, when boats depart, a five-minute service will be maintained.

City Buys Car Line.

Alexandria, La.—The city and the street railway company have perfected arrangements whereby the city will become the owner and operator of the street car property. The price agreed upon was \$30,000, the city to have the use of the street car power plant for four months, or such time as may be necessary to make the changes from that plant to the city's plant. The sale includes practically all of the property of the street car line except the power plant. The Southern Traction & Power Company ask the court to allow them to operate the cars immediately, pending the time when the sale can be perfected. The city proposes to add \$20,000 worth of improvements to the car line and equipment, including new cars.

Standard Seating Space.

New York, N. Y.—The public service commission for the first district has established the standard seating space for each passenger to be allowed on the longitudinal seats of street surface railroad cars as 17.78 inches. This is the average space occupied by each passenger upon such cars according to 800 different cases observed by the commission's inspectors. The establishment of a standard by the commission is mainly for the guidance of the transit bureau in determining the loading and overloading of cars.

Considering Municipal Railroad Ownership.

Los Angeles, Cal.—The council is considering a plan for the public ownership of all electric railroad lines. Under this, which was recommended by the board of public utilities, no more franchises will be granted to the Los Angeles street railway, but the city will enter into indeterminate contracts for lines for which franchises have expired, which would permit such lines to operate until the municipality is in position to take them over. These contracts will be arranged so they may be terminated any time the city desires. Several franchises will expire during the next four years.

MISCELLANEOUS

Philadelphia Housing Legislation Approved.

Harrisburg, Pa.—The Philadelphia housing bill, designed to consolidate the laws for the regulation of the housing conditions in Philadelphia, has been approved by Governor Brumbaugh. The bill was presented after the governor had vetoed the original bill and represents the views of all parties interested. In his veto of the repealer of the housing code of 1913, which related to Philadelphia alone, the governor made the suggestion that the parties in interest should get together and agree upon a just and fair code for the city. The present bill is the outcome. Since passage the governor communicated with the city's director of public health and charities, and with the finance committee of councils. They have agreed that if this bill became a law they will immediately create the housing department provided for in this bill. Philadelphia can now go forward in the matter of proper housing.

Public Market Profitable.

Portland, Ore.—That the public market under the jurisdiction of Commissioner Bigelow has been a distinct financial aid to the city government is shown by the figures of operating expenses for nine months ending June 1. From October 1, 1914, to June 1 of this year the receipts were \$3,625.95 and the operating expenses \$1,909.76, leaving a net gain to the city of \$1,716.19 over operating expenses.

Fatal Bridge Collapse.

Cleveland, O.—One man was killed, three fatally injured, and seven others less seriously hurt when a steel arch at the east end of the new high level bridge being constructed here over the Cuyahoga River collapsed. The span was being constructed to support concrete molds and a cable supporting it let go. Twenty men were thrown seventy feet to the ground amid a shower of debris.

Flood and Storm Sweep States.

Topeka, Kan.—Wild rainfalls caused an 8-foot rise in the Kaw river, which caused the flooding of many creeks and streets, the first floors of many houses being reached. At times there was fear of the dikes being broken but the danger passed. Manhattan, Junction City, Wamego, Abilene and other upper valley cities also suffered.

Indianapolis, Ind.—A wind and rain storm, sweeping Indiana, did damage totaling thousands of dollars to pole lines of public utilities companies. Many buildings were wrecked. Terre Haute, Anderson, Brazil, Danville, Kokomo, Clinton, Hartford City, Logansport, Peru and Frankfort also received damages. Ohio cities, including Columbus, Cleveland and Lockland, were visited, as also were western Wisconsin and part of Minnesota, Iowa and western Pennsylvania. In St. Louis, Mo., the damage was estimated at \$100,000.

Fort Worth, Tex.—Six hundred homes were inundated and 2,000 people rendered homeless by the flooded Trinity river. The city levees broke in four places and the flooded area covered about 3½ square miles. Estimates varying from \$25,000 to \$40,000 are made by the members of the commissioners' court of the amount it will cost Tarrant county to repair flood damages to roads and bridges. Northwestern Texas towns were isolated, railroad communication being demoralized, Wichita Falls and Vernon, particularly, suffering from the havoc.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Torts—Liability For.

Slater v. City of Joplin.—A municipality is acting in its governmental capacity in preserving the public peace, and hence is not liable for injuries received by one, owing either to the negligence of the driver of a patrol wagon, or defects in the wagon itself.—Springfield Court of Appeals, Missouri, 176 S. W. R., 241.

Street—Change of Grade—Liability.

Dahlgren et ux. v. Chicago, M. & St. P. Ry. Co.—Where a street is improved, but does not conform in all respects to the established grade, that fact will not subject it to changes by the municipality, or persons acting under its authority, without giving rise to liability to property owners thereby injured.—Supreme Court of Washington, 148 P. R., 567.

Streets and Bridges—Regulations.

Town of Hedrick v. Lang.—Where the state law allowed traction engines to be run across street and highway crossings, bridges, etc., without planks being kept under the wheels, a municipality, which derives its power solely from the state, cannot, by ordinance, require planks to be kept under the engine wheels.—Supreme Court of Iowa, 152 N. W. R., 610.

Special Assessment Proceedings—Substantial Variance.

City of Chicago Heights v. Angus et al.—Where, in street improvement proceedings, the engineer's first estimate omitted to provide for the improvement of certain streets included in the first resolution, and the ordinance agreed with the resolution, but differed from the estimate, there was a substantial variance, such as invalidated the proceedings.—Supreme Court of Illinois, 108 N. E. R., 758.

Officers—Abandonment of Office—Jurisdiction of Equity.

City of Williamsburg v. Weesner et al.—Where the members of a city council have abandoned and forfeited their offices, and that body is left without a quorum, bringing the machinery of the city government to a standstill, and the city has no adequate remedy at law, a court of equity will declare the offices of the members of the council vacant.—Court of Appeals of Kentucky, 176 S. W. R., 224.

Streets—Duty to Repair.

Mayor, Counselor and Aldermen of City of Annapolis v. Stallings.—The charter of Annapolis, empowering it to prevent and remove nuisances, collect taxes, pass ordinances for paving and repairing the streets, and to tax districts for street paving and repairing, not only empowers the city to repair streets, but imposes on it the duty to do so, and it is liable for its negligent failure to perform that duty.—Court of Appeals of Maryland, 93 A. R., 974.

Fire Regulations—Fire Drills.

City of Chicago v. P. F. Pettibone & Co.—Cities and Villages Act, Art. 5, § 1, Cl. 63 (Hurd's Rev. St. 1913, C. 24 § 62), empowering a city to prevent the dangerous construction of buildings and equipment, to regulate or prevent the carrying on of manufactories dangerous in causing and promoting fires, and to cause all dangerous buildings to be put in a safe condition, does not authorize the passage of an ordinance requiring employers, occupying certain kinds of buildings, to conduct fire drills among their employees, since that clause deals only with the construction of the buildings and apparatus used in them, and is designed to prevent fires, not to deal, as the ordinance does, with the situation after the fire has started. Nor does clause 66 of the same statute, which empowers the city to pass and enforce all necessary police ordinances, authorize the passage of that ordinance, since that is not a delegation of all the police powers of the state, but only of the police powers in relation to subjects which are expressly enumerated in other sections of the act.—Supreme Court of Illinois, 108 N. E. R., 698.

Contractor's Bond—Action Against Surety.

Williams v. Tingey et al.—The surety on a municipal contractor's bond which provided that, if the principal failed to pay for any materials furnished for the work, the surety would do so, can be sued for the value of materials furnished to a subcontractor to be used in the work without the subcontractor having first been sued, and the fact established that the materials were used in the work; since the defense that it was not so used is open to the surety in the action on the bond.—District Court of Appeal, Second District, California, 147 P. R., 584.

Public Improvements—Special Assessments.

Spring Street Co. v. City of Los Angeles et al.; Hamburger Realty and Trust Co. v. Same et al.—Special assessments for public improvements are based on the theory that the improvement benefits the owner; hence, where land is condemned for an improvement, a special assessment of benefits against the remaining property to the value of the property taken, to which was added the cost of making the improvement, is void, because plainly confiscatory.—Supreme Court of California, 148 P. R., 217.

Public Improvements—Control of Improvement Districts.

Town of Augusta et al. v. Smith et al.—As to improvement districts and the control thereof, municipal corporations may exercise only such powers as are conferred on them by statute, or by necessary implication, and property acquired by local assessments taken over by a municipality is held in trust for the property owners of the district who are the real owners, and it is a breach of trust for the municipality to part with the title or to delegate the performance of the trust to some one else.—Supreme Court of Arkansas, 174 S. W. R., 543.

Taxes—Persons Liable—Distribution of Estate.

Bamberger et al. v. Mayor and City Council of Baltimore.—Executors are not liable for taxes assessed after testator's death, where after the assessment and levy thereof, but before they became due and payable, the estate was distributed under order of the court; Code Pub. Civ. Laws, art. 81, Secs. 11, 70, confining liability of administrators and executors for payment of taxes to those due from decedent at the time of his death and to such others as may thereafter become due while the estate is in course of settlement and before distribution, and this being unaffected as to property in the city, by Baltimore City Charter, Secs. 36, 40, relating to the annual budget, and section 170 providing that the valuation of property subject to taxation in the city, as it shall appear on the assessment books October 1st, shall be final and conclusive and constitute the basis on which the taxes for the next ensuing year shall be assessed and levied.—Court of Appeals of Maryland, 94 A. R., 8.

Contracts—Bond—Construction.

National Surety Co. v. City of Huntsville.—A paving contract, requiring the contractor to maintain the pavement in proper repair for five years, and to deliver it in good condition at the end of that time, also provided that the city engineer or street superintendent should be the sole judge of when the pavement needed repair, and that if the contractor should fail to make repairs, or after beginning fail to complete them in a satisfactory manner, the city should be authorized to make the repairs itself or contract for them, and the contractor should, within 10 days after receiving a certificate of the amount of damage, signed by the agent of the city, pay the sum claimed. It also provided that the contractor should not question the necessity for such repairs, or repair work. The performance of the contract was secured by a bond. Held, that where the paving company breached its agreement, the city might recover damages without making the repairs itself, for the word "authorized," used in the contract, means possessed or endowed with authority, and is not equivalent to "required," and hence the making of the repairs by the city was not a "condition precedent," which is the performance of some act or the happening of some event, after the terms of the contract have been agreed on, and before it has taken effect, that had to be performed before recovery.—Supreme Court of Alabama, 68 S. R., 373.

NEWS OF THE SOCIETIES

Calendar of Meetings.

June 22-25.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Annual Spring Meeting, Hotel Statler, Buffalo, N. Y. Secretary, 29 West 39th street, New York City.

June 22-25.
SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION.—Annual Meeting, Iowa State College, Ames, Ia. Secretary, F. S. Bishop, Univ. of Pittsburgh, Pittsburgh, Pa.

June 22-26.
AMERICAN SOCIETY FOR TESTING MATERIALS.—Annual Meeting, Atlantic City, N. J. Secretary, Edgar Marburg, Univ. of Pennsylvania, Philadelphia, Pa.

June 23-24.
NEW YORK STATE ASSOCIATION OF FIRE CHIEFS.—Annual Convention, Peekskill, N. Y. Secretary, Chief Henry R. Yates, Schenectady.

June 25.
BADGER FIREMEN'S ASSOCIATION OF WISCONSIN.—Annual tournament, North Milwaukee.

June 25-July 1.
THE COUNTY COUNCILS ASSOCIATION (Great Britain).—National Road Conference and Exhibition, London, England. Business Manager, A. F. May, 13 Victoria Street, Westminster, S. W., London, England.

July 5-7.
KANSAS STATE FIREMEN'S ASSOCIATION.—Annual Convention, Petoskey.

July 20-23.
IOWA STATE FIREMEN'S ASSOCIATION.—Annual Convention, Iowa City. Secretary, E. E. Parsons, Marion.

July 27-29.
ILLINOIS STATE FIREMEN'S ASSOCIATION.—Annual Convention, Blue Island. Secretary, Walter E. Price, Champaign.

Aug. 2-4.
PROVINCIAL FIREMEN'S ASSOCIATION OF ONTARIO.—Annual Convention, Thorold. Secretary, W. J. Thompson, 282 Western Ave., Toronto.

Aug. 2-6.
GOOD ROADS CONGRESS.—San Francisco, Cal., under the auspices of the Tri-State Good Road Association.

Aug. 4-5.
TEXAS GOOD ROADS ASSOCIATION AND COUNTY JUDGES' AND COMMISSIONERS' ASSOCIATION.—Midsummer meeting, Agricultural and Mechanical College of Texas, College Stat., Tex. Secretary, Texas Good Roads Assoc., D. E. Colp, San Antonio.

Aug. 31-Sept. 3.
INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS.—Annual Convention, Cincinnati, O.

Sept. 7-9.
NEW ENGLAND WATERWORKS ASSOCIATION.—Annual Convention, New York City. Secretary, Willard Kent, 715 Tremont Temple, Boston, Mass.

Sept. 13-19.
PAN-AMERICAN ROAD CONGRESS.—Held by American Road Builders' Association and the American Highway Association. Oakland, Cal.

Sept. 16-18.
AMERICAN ELECTROCHEMICAL SOCIETY.—Twenty-eighth annual general meeting, San Francisco. J. M. Muir, 239 West 39th street, New York City, Chairman of Transportation Committee.

September 16-25.
INTERNATIONAL ENGINEERING CONGRESS.—Am. Soc. C. E., Am. Inst. Min. E., Am. Soc. Mech. E., Am. Inst. E. E. and Soc. N. A. & M. E., San Francisco, Cal. Secretary, W. A. Catell, Foxcroft Building, San Francisco, Cal.

Sept. 22-24.
MASSACHUSETTS STATE FIREMEN'S ASSOCIATION.—Annual convention, Haverhill, Mass. George Wilson, Lynn, Mass., Chairman of Committee.

Oct. 11-15.
NATIONAL PAVING BRICK MANUFACTURERS' ASSOCIATION.—Annual Convention, Dayton, O. Secretary, Will P. Blair, B. of L. E. Bldg., Cleveland, O.

October 12-15.
AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.—Annual Convention, Dayton, O. Secretary, Charles Carroll Brown, 702 Wulsin Bldg., Indianapolis, Ind.

November 17-19.
NATIONAL MUNICIPAL LEAGUE.—Annual Convention, Dayton, O. Secretary, Clinton Rogers Woodruff, 705 North American Bldg., Philadelphia, Pa.

Dec. 27-Jan. 8, 1916.
SECOND PAN-AMERICAN SCIENTIFIC CONGRESS.—Washington, D. C., Department of State, Washington.

PAN-AMERICAN ROAD CONGRESS.

The executive committee of the Pan-American Road Congress has received word from the officials of the Tri-State Good Roads Association that it has been decided to co-operate with the Pan-American Road Congress by changing the date of the Pacific Coast Good Roads Congress from the week of Aug. 2 to that of Sept. 13. This means the practical merging of the meeting of the Tri-State Association into that of the Pan-American Road Congress.

At the meeting of the executive committee which was held in New York City May 22, it was felt that the co-operation that will thus be secured through the action of the Tri-State Good Roads Association will be of very material assistance in making the Pan-American Road Congress, to be held in Oakland, Cal., Sept. 13-17, the greatest gathering of its kind ever held in the world.

The Pan-American Road Congress, as already announced, will be held under the direct auspices of the two leading national good roads organizations, namely, the American Road Builders' Association and the American Highway Association. Plans for the meeting are in the hands of an executive committee, made up of Governor Charles W. Gates of Vermont, chairman, and two members from each of the two organizations.

Progress reports of the various subcommittees were submitted at the meeting of the executive committee last week. It is apparent that great interest is being taken by the public in the forthcoming congress. Official invitations will soon be issued to all the several states of the United States, the Canadian provinces and the South American countries to send delegates.

While the topics have not as yet all been assigned to the speakers, the following subjects were decided upon at the last meeting of the committee:

"The History and Future of Highway Improvement," "The Benefits and Burdens of Better Roads," "The Relation of the Road to Rail and Water Transportation," "The Responsibility for Road Conditions, and the Way to Secure the Improvement of Road Conditions," "Tree Planting and Roadside Aesthetics," "The Essentials of Proper Laws for Highway Work," "Highway Indebtedness; Its Limitation and Regulation," "Organization and System in Highway Work," "The Educational Field for Highway Departments," "System in Highway Accounting," "Uniformity for Highway Statistics and Data," "Engineering Supervision for Highway Work," "The Merit System in Highway Work," "The Determination of the Justifiable Outlay for Specific Cases of Proposed Highway Improvement," "Proper Road

Location; Its Importance and Effects," "Road Drainage and Foundations," "Highway Bridges and Structures," "Roadway Surfacing," "Resurfacing Old Roads," "Street Pavements," "Convict Labor for Highway Work," "Equipment for Highway Work," "Motor Traffic; Its Developments, Trend and Effects," "Load and Tire Effect and Regulation," "Comparisons of Traffic and Their Economic Value," "Maintenance, Materials and Methods," "Dust Suppression and Street Cleaning."

At the meeting of the executive committee held in New York City June 7, it was decided to run a train to be known as the Pan-American Road Congress Special to accommodate delegates to the great meeting to be held at Oakland, Cal., during the week of Sept. 13 next. The lines over which the special will be run have not yet been fully determined, but it is proposed to so arrange it that delegates may have the benefit of one of the best of the scenic routes to the Exposition. More complete details of the arrangements will be announced at an early date. The executive committee has received letters from various municipalities and organizations, inviting the delegates to stop at points along the way and make local tours of inspection. It is probable that some of these invitations will be accepted and, as the party will be made up of many of the leading road builders of the country, it is felt that such inspection trips will prove very interesting and instructive both to the visitors and to the municipalities.

For the purpose of carrying on its work with the highest efficiency possible, the executive committee has decided to appoint local representatives or chairmen in all the principal cities throughout the United States and Canada. Each local representative will look after the interests of delegates from his section, give the Pan-American Road Congress as wide publicity as possible, and help to arouse interest in the Congress. It is believed that this will insure the widest possible publicity for the Congress.

American Society of Mechanical Engineers.

The program of the spring meeting of the American Society of Mechanical Engineers, which is now being held at Buffalo, N. Y. (June 22-25), is as follows:

Tuesday, June 22.

2.00 p. m.—Opening of headquarters and registration.

6.00 p. m.—Conference and dinner of officers and representatives of local sections and the local sections committee.

8.30 p. m.—Informal reception and reunion.

An address of welcome will be made by Mr. Frank B. Baird, representing the industries of Buffalo, to which Dr. John A. Brashear, president of the society, will respond. The evening will

afford an opportunity for the reunion of members and their reception by the Buffalo engineers. Refreshments will be served.

Wednesday, June 23.

9.00 a. m.—The party will leave Hotel Statler by special trolley cars for Niagara Falls. Price for the round trip, including the Gorge Route, \$1.25.

10.30 a. m.—Business meeting. Report of tellers on amendment to constitution. Presentation from the council of proposed amendments to C 53 and C 48 of the constitution. Reports of professional committees.

Auditorium of The Shredded Wheat Co.'s Factory.

Professional Session Following Business Meeting.

The Study of a Shaft and Its Improvement by Heat Treatment, John Younger.

A Comparison of the Properties of Nickel, Carbon and Manganese Steel, Robert R. Abbott.

Use of Corrugated Furnaces for Vertical Fire-Tube Boilers, F. W. Dean.

On Measuring Gas Weights, Thos. E. Butterfield.

During the morning the ladies will have time at their disposal to visit the Shredded Wheat Company's factory and the plant of the Falls Chocolate Company, as well as to enjoy the outdoor surroundings of the Federal Reservation at the brink of the falls.

1 p. m.—Luncheon at the International Hotel, price 75 cents.

Wednesday Afternoon

2.30 p. m.—Special cars will be provided for those who desire to take the Gorge Route trip, the price for which is included in the round-trip ticket from Buffalo. There will be an opportunity for those who do not take this trip to inspect the power plants both on the Canadian and American sides, or to enjoy the scenic beauties of Niagara Falls and Goat Island.

5 p. m.—The special cars for Buffalo will leave the International Railway Station.

Wednesday Evening.

8.30 p. m.—Illustrated lecture on "The Engineer as a Citizen," by Dr. F. H. Newell, formerly Chief of the U. S. Reclamation Service.

Thursday, June 24.

10 a. m.—Simultaneous professional sessions.

Professional Session.

Ball Room, Second Floor, Hotel Statler.

Rational Design and Analysis of Heat Transfer Apparatus, E. E. Wilson.

Influence of Disk Friction on Turbine Pump Design, F. zur Nedden.

Surface Condensers, C. F. Braun.

Simultaneous Session.

Assembly Room, Second Floor, Hotel Statler.

Some Mechanical Features of the Hydration of Portland Cement and the Making of Concrete As Revealed by Microscopic Study, Nathan C. Johnson.

Design of Rectangular Concrete Beams, Howard Harding.

Model Experiments and the Forms of Empirical Equations, Edgar Buckingham.

The Effect of Relative Humidity on An Oak Tanned Leather Belt, W. W. Bird and F. W. Roys.

11 a. m.—Automobile ride for the ladies through the city and its environs and the park system.

Thursday Afternoon.

2 p. m.—Council meeting. Assembly Room, Second Floor, Hotel Statler.

2 p. m.—Parties will leave the hotel to visit manufacturing plants and points of interest.

5 p. m.—Tea will be served for the ladies and members by the Twentieth Century Woman's Club at their club house, 495 Delaware avenue.

Thursday Evening.

9 p. m.—Reception and dance.

Ball Room, Second Floor, Hotel Statler.

This will be the leading social function of the spring meeting. It is expected that many residents of Buffalo will attend as well as their visiting friends. A collation will be served. Invitations will be sent to all who register at headquarters, which, to be valid, must be endorsed at the registration desk and for which there will be a charge of \$2.50 per person.

Friday, June 25.

10 a. m.—Professional session.

Ball Room, Second Floor, Hotel Statler.

Laws of Lubrication of Journal Bearings, M. D. Hersey.

The Relation Between Production and Costs, H. L. Gantt.

Laps and Lapping, W. A. Knight.

This is the last session, but it is planned that any who desire may visit manufacturing plants during the afternoon and the local committee will be pleased to provide guides for this purpose.

National Electric Light Association.

The thirty-eighth annual convention of the National Electric Light Association was held in Native Sons' Hall, San Francisco, Cal., June 7-11. After an address of welcome by Mayor Rolph and an address by President Scott, reports of officers and committees were heard.

The power sales committee report, read by Chairman J. N. McDougal, of San Francisco, dwelt principally upon "Typical Sales Development in the West." The report on "Merchandising and Recent Development of Electric Appliances" was presented by R. R. Young, of the Public Service Electric Company of Newark, N. J. Four phases of merchandising were discussed: "Advertising," "Show Window and Interior Displays," "Selling Force" and "Industrial Appliance Business."

The first hydro-electric session and the second technical session were held concurrently. P. M. Downing, of San Francisco, read the address of Chairman M. R. Bump, of the hydro-electric committee. Chairman T. C. Martin, of the hydro-electric and transmission

progress committee, read a paper on that subject.

The report of the committee on "Prime Movers" was read by O. B. Coldwell, of the Portland (Ore.) Railway, Light & Power Company, in the absence of Chairman I. E. Moulthrop, of Boston. This covered gas power as well as steam and water power.

At this section a paper was read by J. P. Jollyman, of San Francisco, on "Practice in High Head Hydraulic Plants." E. D. Searing, of Portland, spoke on "Analysis of Water Wheel Governor Effort," and C. H. Delany, of San Francisco, discussed "Oil Burning Standby Plants," while P. M. Downing, of San Francisco, discussed "Water Power Development on the Pacific Coast."

At the second accounting session Vice-Chairman H. M. Edwards read a paper on "Workmen's Compensation Insurance" which had been prepared by Walter G. Cowles.

The officers elected for next year are:

President, E. W. Lloyd, Chicago; vice-presidents, H. A. Wagner, Baltimore, W. F. Wells, Brooklyn, R. H. Ballard, Los Angeles, R. S. Orr, Pittsburgh; treasurer, W. H. Atkins, Boston; insurance expert, W. H. Blood, Jr., Boston; secretary, T. Commerford Martin, New York; assistant secretary and treasurer, Harriet Billings, New York; new members of the executive committee, J. E. Davidson, Portland; H. C. Abell, New York; H. C. Bradlee, Boston; R. F. Pack, Minneapolis.

Safety First Federation of America.

At a meeting held recently at Detroit, seventeen rules for the regulation of traffic were submitted by the street traffic committee. Among them were the following:

To have education and special instruction of policemen before assigning them for traffic duty.

A standard code of hand signals to be used by traffic officers.

Fixed locations for traffic officers at intersections to be distinctly marked.

Elimination of glare of head and side lights.

Use of muffler cut-outs to be prohibited.

Standardization of left-hand turns at intersections.

Near-side stop for street cars.

Rear lights on all horse-drawn vehicles.

Elimination of steps on all horse-drawn and motor trucks.

Standard size, color, design and means of attachment for all traffic signs, including school, hospital, church, safety zones, fire hydrant, railroad and street railway crossings, alley, mail box, playground, crosswalk, parking, etc.

Designation of safety zones and crosswalks as embodied in the Detroit plan of painting.

Education of the public to use crosswalks at intersections and authorizing police departments to control pedestrians. (Continued on page 908.)

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

ALLIS-CHALMERS OIL ENGINE. Diesel Type.

The advantages of the Diesel type of oil engine have, of course, been fully demonstrated. The distinctive features of the Diesel system are the use of a compression temperature sufficient for ignition and the atomization of the liquid fuel oil by compressed air. The compression temperature is increased during combustion to a point sufficiently high to completely burn the fuel, free carbon and all, resulting in clear exhaust and high economy. The admission of the fuel is so gradual that the combustion is not of an explosive nature and during combustion the pressure does not rise appreciably and the compression is gradual, resulting in smooth and quiet running. There is no fuel present in the cylinder until the proper time for combustion, thus preventing "back-fires" and pre-ignitions.

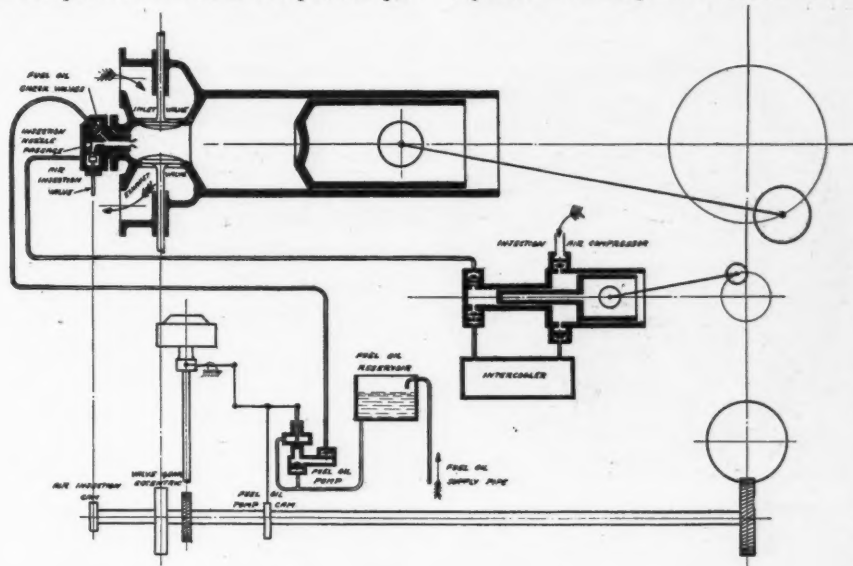
The Allis-Chalmers oil engine is claimed to combine the advantages of the Diesel system with special constructive features essential for reliability in service. The engine is of the four-stroke cycle, horizontal type, with the open fuel nozzle and low pressure starting system. These features are claimed to overcome the chief objections of inaccessibility, uncertain piston lubrication and the clogging of the fuel nozzle to which the older types were subject.

The four-stroke cycle has been found the most economical and reliable and permits simple and accessible design and positive control of every event in the cycle. During the suction, the pure air is drawn into the cylinder through the main inlet valve and a

proper charge of fuel oil (determined by the position of the regulator) is pumped without pressure into the injection nozzle passage. On the compression stroke the air in the cylinder is compressed to about 500 pounds per

of combustion are expelled from the cylinder.

The open fuel injection nozzle is a very important advance in Diesel type construction. It consists of an oil receptacle with separate inlets for the



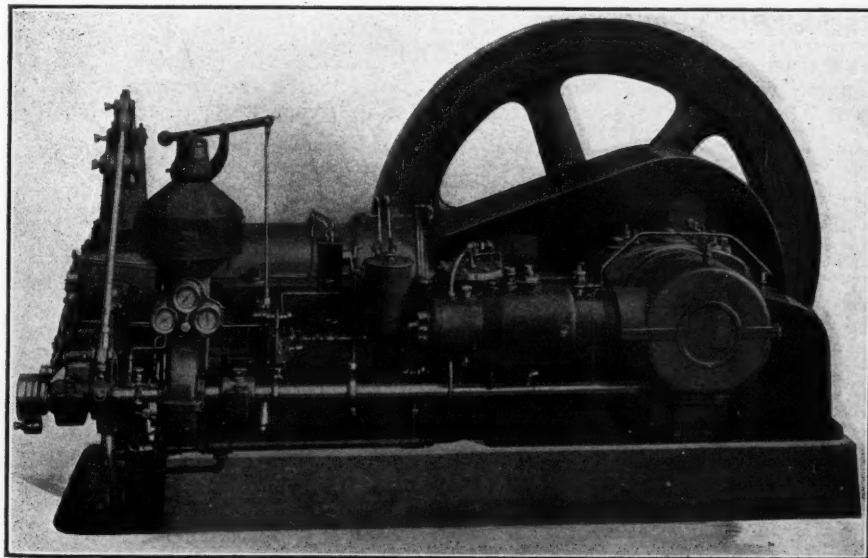
INSTALLATION OF ALLIS-CHALMERS OIL ENGINE.

square inch, which gives it a temperature over 1,000 degrees Fahrenheit. At the beginning of the power stroke air from the compressor at about 900 pounds per square inch is admitted through the injection nozzle for a period of about 10 per cent of the stroke. The oil previously deposited in the injection nozzle during the previous stroke is picked up by the injection air and gradually sprayed into the combustion chamber. The final stroke is the exhaust, in which the products

oil and air at one end, and connected to the combustion chamber at the other end by a stationary atomizing device. The oil is pumped into the receptacle through check valves during the suction stroke of the engine and the injection air is admitted through a separate mechanically operated timing valve. This design prevents clogging and allows use of lowest grade oils.

The horizontal construction is advantageous in rigidity, ease of inspection and simplicity of valve and valve gear arrangement. Another important feature is the frame construction—a one-piece casting bored to receive the cylinder liner and cored to form a water jacket around the liner. This separate construction permits the frame to be of a tough cast iron and the liner of hard, close-grained iron of good wearing qualities. The engine has a false piston head to receive the direct heat of combustion. The governor is the standard Allis-Chalmers single tension spring type.

The Allis-Chalmers oil engine is made in sizes from 60 h. p. per cylinder and upwards in one, two and four cylinder units, making a full line of sizes and cylinder arrangements. Combined units of every variety may be obtained. The accompanying illustrations show an Allis-Chalmers Diesel oil engine and a schematic layout of an installation. These engines are made by the Allis-Chalmers Mfg. Co., Milwaukee, Wis.



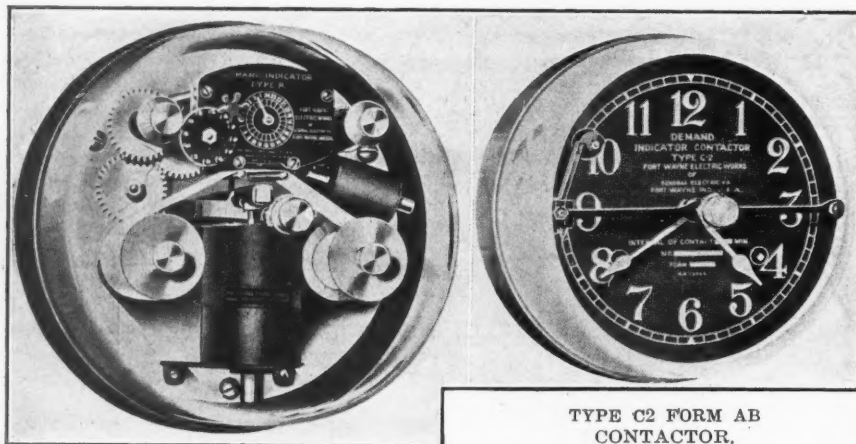
ALLIS-CHALMERS DIESEL ENGINE.

DEMAND INDICATORS.

Maxicator and Printometer Types for Periodically Registering Consumption.

THE PRINTOMETER.

In verifying or establishing equitable rates, determining load factors or diversity factor, regulating the use of off-peak load, determining the use of break-down service, handling complaints, making special tests of power conditions, and assisting new business departments in securing customers, information as to energy consumption and maximum demand is necessary.



TYPE P FORM AB DEMAND INDICATOR.

TYPE C2 FORM AB CONTACTOR.

For this information some type of "demand indicator" is used. These are used in connection with the regular watt-hour meter and they are regulated for indication by means of clockwork contactors which cause registration at predetermined times or during certain intervals.

The type P demand indicator, or Printometer, makes a printed record of the total energy consumption as registered by the watt-hour meter at regularly recurring time intervals, the time of day being simultaneously recorded. From the record the maximum consumption and maximum demand are easily read. The indicator contains a set of cyclometer type wheels, which are electrically interlocked with the register of the meter. They are moved forward at a rate exactly equal to the rate of flow of power through the meter, and will, therefore, at any instant give an indication equivalent to the dial reading. Through a rubber platen and copying ribbon this reading is printed on a paper tape. This platen is operated by a contact making clock. In the indicator an hour wheel containing numbers from 1 to 24 is connected to the printing solenoid plunger through a star and pin wheel in such a way that it is possible, by changing the positions of the pins, to advance the hour wheel one number every second, third, fourth or sixth time. The contactor is arranged to close the circuit in the corresponding intervals. There are a number of forms of this type of indicator.

Type C₂ contactor is unlike other clock mechanisms for periodically closing circuits, the power for operating the contact device itself not being taken from the clock, but from a second independent main spring.

THE MAXICATOR.

The type M "demand indicator," or Maxicator, is used for similar purposes as the printometer, only it indicates on a dial the measured maximum demand during 30 or 15-minute intervals over any period, such as, for instance, a week or a month. The indicator is similar to the register of the ordinary watt-hour meter and is designed to be

immediately starts revolving again but does not re-engage the pointer unless the demand is greater during the next interval, in which case the gears revolve more and pick up the hand. The point to which the hand is carried and finally left is therefore an indication of the greatest consumption of energy that has passed through the meter during the predetermined interval.

There are a number of forms of this type and also of the contactors used in connection with the indicator.

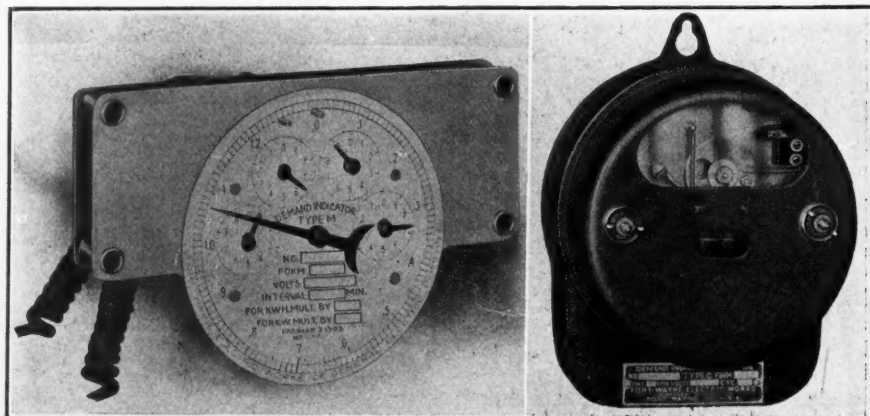
The accompanying illustrations show the type P form AB demand indicator and the type C₂ form AB contactor, and also the type M indicator and the type C form AA contactor. These instruments are made by the Fort Wayne Electric Works of the General Electric Co., Fort Wayne, Ind.

CONCRETE LAMP POSTS.

Star Posts Made by New Process.

The use of reinforced concrete for lamp posts is becoming rather popular because of the ease of installation, the light weight and the possibilities of artistic appearance. The Star lamp post consists of a solid piece of waterproof concrete made from a special wet poured mixture of cement and crushed stone by a new process which is claimed to bring out the natural sparkle of the mineral ingredients. The absence of sharp corners and unnecessary ornamentation reduces the chance of breaking and chipping and practically eliminates the possibility of collecting dust and dirt.

As the post is light in weight and moulded in one piece it is very easily erected by two men without the use of a derrick or other lifting device. Transportation charges are reduced for the same reason. Owing to the construction foundation bolts are not necessary and the erection cost is reduced to a minimum. All exposed metal parts, such as globe holders and hand hole covers are made of cast bronze. The use of "rail carbon" steel reinforcing rods embedded in waterproof concrete not only eliminates the possibility of rust and corrosion discoloring the finished surface, but also makes the post very durable. The concrete is cured and finished without the use of steam, acids or bush-hammers,



TYPE M DEMAND INDICATOR.

TYPE C FORM AA CONTACTOR.

and is guaranteed to withstand the most severe weather conditions.

The single standard Star posts are made in 8, 10, 12 and 14-foot lengths, and similar posts are made for cluster lamps, street signs, fire alarm boxes, traffic signal systems, etc. The posts are finished to represent any desired variety of natural granite, marble or stone. A recent installation of Star posts was 210 type "D" for Portage Park, Chicago. They are 10 feet high, natural rough cut granite finish, and hold each a 200 watt nitrogen-filled lamp.

The accompanying illustrations show three of the types and a diagram shows the construction details. The Star

Chicago Concrete Post Co., 608 South Dearborn street, Chicago, Ill.

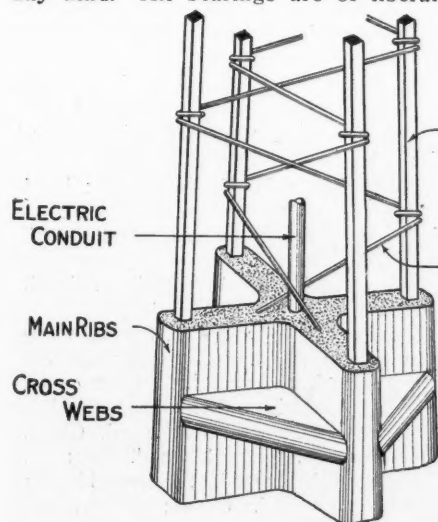
THE "INGECO" ENGINE.

A Crude Oil Engine of Semi-Diesel Type.

The International Gas Engine Co., Cudahy, Wis., has developed a two-cycle crude oil engine, which is especially adapted for heavy duty work. This engine, which is of the semi-Diesel type, has been designed for the purpose of utilizing crude oil for fuel, of a gravity from 26 to 39 degrees Baume, and low-grade distillates. It may also be operated on the lighter grade oils, such as kerosene. This "Ingeco" engine is of symmetrical and substantial design and introduces several new distinctive and improved ideas in mechanical construction.

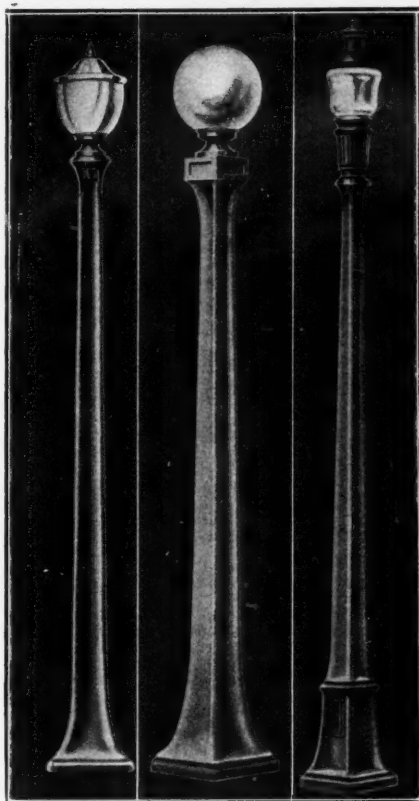
Scavenging is accomplished through the use of a special scavenging piston and cylinder with air-receiving base, instead of by crank-case compression. An ample surplus of air is provided by making the scavenging cylinder very much larger in volumetric displacement than that of the combustion piston.

The atomizer is of special design and it thoroughly atomizes the fuel and assures practically complete combustion. Lubrication is effectively taken care of by force sight feed lubricator, there being no grease or oil cups of any kind. All bearings are of liberal



CONSTRUCTION OF STAR CONCRETE POST.

proportions. The governor is located in the flywheel, which has a special hub, is of simple centrifugal type, powerful and sensitive to variation in



Type E. Type D. Type F.
STAR CONCRETE POSTS.

load conditions. This engine is liberally rated and is claimed to deliver its power quietly and without undue heating or stress of parts.

The accompanying illustration shows the engine.

INDUSTRIAL NEWS

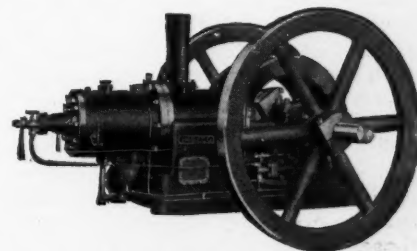
Cast Iron Pipe. — Chicago — The award of 300 tons at Milwaukee has been made to the leading interest. At Kenosha, Wis., bids on 2,500 tons of 42-inch have been opened and St. Louis has bids on 2,600 tons. Cincinnati has bought 2,000 tons of 36-inch. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$23.50; 16-inch and up, \$23. Birmingham—No orders of special size have been received in this district but a satisfactory output is being maintained. Quotations: 4-inch, \$20; 6-inch and up, \$18. New York—Municipal lettings are still few in number. South Easton, Mass., opened bids on 1,100 tons of 4, 6 and 8 inches. Prices are slightly higher. Quotations: 6-inch, class B and heavier, \$22.50 to \$23 per net ton; Class A, \$23.50 to \$24.

Lead.—Lead apparently reached the climax of

its upward movement and there are now numerous offerings which tend to ease prices. Quotations: New York, \$1; St. Louis, \$7.

The Hagar Portland Cement Co., organized on June 9 under the laws of Maine, incorporates the cement company projected by Edward M. Hagar, who lately resigned the presidency of the Universal Portland Cement Company for the purpose of forming a company to acquire and operate a chain of cement plants to cover the territory between the Atlantic seaboard and the Rocky Mountains. The capital stock of the company is \$20,000,000, all common. Mr. Hagar announces the election and appointment of the following list of officers and assistants: Edward M. Hagar, president; Morris Metcalf, vice-president; B. H. Rader, vice-president and sales manager; Gordon Wilson, secretary and in charge of cost accounting; Leonard Wesson, assistant to president in operation and construction; J. P. Beck, assistant to president in extension work; C. W. Lyon, engineer of economies; J. H. Barbazette, superintendent of construction. Pending the election of a permanent treasurer, the office will be filled by Gordon Wilson. The general offices of the company are located at 208 South La Salle street, Chicago.

The Universal Portland Cement Co., 208 South La Salle street, Chicago, Ill., makes the following announcements: R. F. Atkins, formerly assistant credit manager at Chicago, has been appointed eastern credit manager at Pittsburgh, vice L. S. Fuqua, deceased. Ray S. Huey, formerly assistant general superintendent Buffington plant, Buffington, Ind., has been appointed superintendent of the Duluth plant, Duluth, Minn. Fred Robinson



"INGECO" OIL ENGINE.

has been appointed assistant superintendent of that plant. C. O. Soderquist, formerly superintendent of Mill No. 6 at the Buffington plant, has been appointed assistant general superintendent Buffington plant. J. H. Kempster, formerly chief chemist Buffington plant, is now superintendent of Mills Nos. 3 and 4 of the Buffington plant. M. S. Humphreys, formerly chief draftsman, has been appointed superintendent of Mill No. 6 at Buffington, Ind.

The Dayton Rubber Manufacturing Co., Dayton, O., is stopping the circulation of an erroneous report that an automobile fire engine in the Pomona, Cal., department, while on the way to a fire some weeks ago, had thrown one of the Dayton Airless tires with which it was equipped. A letter from Fire Commissioner Wm. McMullin says that the report is absolutely without foundation and that car and tires have never given any trouble at all. The truth of the case was that a reserve car, after the fire, went back to pick up a hose line and in doing so lost a front pneumatic tire and this incident may have led to the false report.

TRADE LITERATURE.

The Ayer & Lord Tie Co., Railway Exchange Building, Chicago, Ill., has issued a neat new booklet on interior wood block floors, with illustrations of plants using them and exposition of their advantages.

The Ingersoll-Rand Co., 11 Broadway, New York, has issued a new bulletin, No. 4034, describing and illustrating the No. 26 Leyner-Ingersoll water drill which this company has produced to meet the demand for a light weight Leyner-Ingersoll drill.

NEWS OF THE SOCIETIES.

(Continued from page 904).

trian travel as provided in section 2 of the Detroit traffic ordinance.

Standard traffic ordinance and code of regulations for adoption by all cities.

Licensing of drivers or operators of all motor vehicles.

Exclusive use of siren whistles on police and fire vehicles.

Standardization of accident reports by municipalities.

Chain guards on vehicles driven by side chains.

The following subjects were discussed, but action was deferred until the next meeting of the committee:

Prohibiting the interrupting of traffic officers while on their posts of duty to obtain information and substituting central information bureaus for this purpose.

Hours of duty for traffic officers.

Rotary traffic.

Uniform rule to be adopted relating to clothing, platforms and shelters for traffic officers.

Parking: Parallel, angular, 15 to 60 minute time limit.

Oregon Municipality League.

The second annual conference of the Oregon Municipality League, the second also to be devoted exclusively to a study of city problems in the state, limited to discussions on city charters and city planning in Oregon, was held at Eugene, May 27-28. A charter committee composed of the following was appointed: B. C. Sheldon, R. F.

The Whitman Agricultural Co., St. Louis, Mo., is distributing a new catalogue, No. 71, describing and illustrating its line of contractors' equipment, including the Sultan gasoline engine, portable lighting plant, pumps of various types, hoists, drop hammers, buckets and saws.

The Trussed Concrete Steel Co., Youngstown, O., has issued the thirteenth edition of its "Hy-Rib" handbook describing the use of Hy-Rib in roofs, floors, walls, sidings, partitions, ceilings and furring and also in silos, tanks and conduits. The material, specifications and principles of Hy-Rib construction are clearly explained and the advantages of its use illustrated by photographs of examples. Other Kahn products, including Rib Lath, pressed steel and Floretype, are also described.

The Chicago Pneumatic Tool Co., Fisher Building, Chicago, and 52 Vanderbilt street, New York, have issued Bulletin 34-X, relating to their Class A-G "Giant" gas and gasoline engines. The bulletin illustrates these engines in six sizes, ranging in horsepower from 16 to 130. The engines are similar in general design to the "Giant" fuel oil driven engines manufactured by the same company with the exception that they are designed for operation with manufactured or natural gas.

Tischer, F. J. Tooze, R. G. Dieck and D. C. Sowers. A committee on city planning was also appointed as follows: E. T. Mische, M. N. Dana I. N. McArthur and E. F. Lawrence.

It was decided to hold a winter meeting of the league in Portland. The following officers were re-elected: President, Thomas N. Strong, of Portland; vice-president, Albert C. Smith, Albany; secretary-treasurer, Professor F. C. Young, of Eugene.

Among the interesting papers were: "Salient Features of Modern City Planning," by B. C. Sheldon; "Charter Needs of Oregon Cities," by L. M. Cure, mayor of Albany; "Efficiency and Economy in Municipal Administration," by A. L. Barbour, city auditor, Portland; "City Planning Commissions for Oregon Cities," by E. T. Mische.

Carolina Municipal Association.

The annual convention of the Carolina Municipal Association is being held at Asheville (June 17-18). Former Mayor Charles A. Bland of Charlotte is president and O. P. Shell of Dunn, secretary and treasurer.

Mayor Thomas J. Murphy, of Greensboro, is among the speakers on the program of the Municipal Association, having as his subject, "Benefits of the Municipal Association to the Cities and Towns." He will be followed by Sherwood Brockwell, fire department instructor of the North Carolina insurance department, who speaks on "Fire Prevention." In this connection it is interesting to note that the existence of this office is in large measure due to the efforts of this organization, for

it was in the municipal association that the idea was conceived of inducing the state to hire an instructor for the local fire departments.

Among the addresses on the program, besides the two mentioned above, are "City Health Problems," by Dr. C. B. Reynolds, superintendent of health of Asheville; "City Planning," by Mayor O. B. Eaton, of Winston-Salem; "City Finances," by Mayor P. Q. Moore, of Wilmington; "City Sanitation and Inspection," by Mayor L. F. Tillery, of Rocky Mount; "Relation of Public Service Corporations to City Government," by James I. Johnson, of Raleigh; "Law Enforcement," by Mayor T. L. Kirkpatrick, of Charlotte; "Street Paving as a Municipal Asset," by Mayor Fred I. Sutton, of Kinston; and "Moonlight Schools," by John D. Ezzell, superintendent of Harnett county schools, and originator of the Moonlight School idea in North Carolina.

PERSONALS

Henry Welles Durham, C.E., recently chief engineer of highways, Manhattan borough, New York City, and formerly resident engineer Panama municipal improvements and of the Cape Cod Canal, announces his association with Percival Robert Moses, E.E., consulting electrical and mechanical engineer, at 366 Fifth avenue, New York. The firm will specialize in highway and other municipal engineering work.

Gibson, John Simpson, secretary and treasurer of the Passaic Valley sewerage commission and auditor of the New Jersey state firemen's relief association, died June 4 at his home in Newark. Death was due to a complication of diseases. He had been ill some time, but it was only about two weeks ago when his condition compelled him to relinquish his office duties. He was sixty-six years old.

Lyon, George L., has resigned as police commissioner of Durham, N. C.

Palmer, S. A., has been elected a city commissioner of Santa Cruz, Cal.

Reed, George A., has been elected city engineer of Barre, Vt.

Sebastian, Charles E., chief of police of Los Angeles, Cal., was elected mayor at the recent election.

Weddle, John W., has been appointed chief of police of Troy, O.

The following were elected in Illinois:

Troy—James H. Davis, mayor; Fred H. Gornet, city clerk; Fred Mosimann, city treasurer; aldermen, first ward, Wm. Preston; second ward, James W. Taylor, and third ward, Adolph Meyer.

Granite City—Joseph C. Steele, mayor; city clerk, George Furnish; city attorney, Mark Meyerstein; treasurer, O. D. Hiatt; superintendent of streets, Ed. E. Price; aldermen, first ward, Chris. M. Schwartz; second ward, Bert E. Hodges; third ward, Stanley Hollis; fourth ward, Ed. Bauer; fifth ward, Wm. Neipert.

Chinnock, Charles E., a manufacturer of telegraph instruments and one of the pioneers of the electric light and telephone industries, died June 5 at his home, 157 Sixth avenue, Brooklyn, in his seventieth year. Mr. Chinnock was born in London and on coming to this country he began his active life as a telegrapher. The telephone and electric light were still in their infancy when he became associated with Thomas A. Edison and later became superintendent of the first central station of the New York Edison company. As the vice-president of the Edison United Manufacturing Company, the parent Edison company, Mr. Chinnock was largely responsible for the founding of the Edison Electric Illuminating Company of Brooklyn. The Edison United Manufacturing Company was later merged with the Thompson-Houston Company and became known as the General Electric Company. Mr. Chinnock was also chief electrician of the Metropolitan Telephone Company, now the New York Telephone Company, and had patented many useful electrical inventions, among them an automatic transmitter for teaching telegraphy that was adopted by the United States Government. Another of his inventions, which is used by all the telephone and telegraph companies is a method of suspending aerial cables. Mr. Chinnock is survived by his widow, a son and a daughter.

Babcock, E. E., has been appointed chief of the Topeka, Kan., fire department, succeeding Joseph J. Hanlon, who will take a long vacation trip.

Boardman, Avery W., and Gessner, G. A., public service director and waterworks superintendent, respectively, of Toledo, O., have resigned.

Clark, John, has been elected chief of the Rutherford, N. J., fire department.

Cranford, C. C., mayor of Ashboro, N. C., has resigned on account of illness. D. B. McCrary automatically becomes mayor.

Dixon, Dr. Samuel G., has again been appointed commissioner of health for Pennsylvania. He has held the office ten years.

Fourtillott, Major A. T., has been appointed chief of police of Dixon, Ill.

Noe, J. D., succeeds the late Chief Holcombe as chief of police of Greenville, S. C.

Dr. Golden, of Elkins, W. Va., has been elected president of the state public health council.

Holcombe, James E., chief of police of Greenville, S. C., died May 30 from wounds received while making an arrest.

Justin, N. C., has been elected borough commissioner of Haddonfield, N. J.

Lyter, Albert, has been chosen chief of police of Pomona, Cal., succeeding Thomas Ovington, resigned.

Quigg, J. H., has been appointed secretary of the Passaic Valley sewerage commission.

Miller, Chester, has succeeded Barney Kelley as chief of police of Kokomo, Ind.

Morton, L. F., has resigned as mayor of Redding, Cal. Oswald Gruthur will succeed him.

Nixon, Edward, has been elected by the city commissioners as superintendent of the Lawrenceburg, Tenn., light and water plant. He succeeds T. E. Yarbrough, who goes to Columbus, Miss. Mr. Nixon operated the plant the first three years after it was installed.

Sellers, Andrew A., superintendent of state highways in Chester County, Pa., has resigned.

Sheehan, John J., supervisor of the Rainier National park, who was appointed to his position only last September, taking active control of the park in October, has resigned, his resignation to take effect June 1.

Sullivan, Peter H., chief of the Phoenix, Ariz., fire department, died June 4, aged 41. Capt. A. F. Wright will succeed him.

Turner, James A., mayor of Louisville, N. C., has resigned and Captain L. L. Joyner has been appointed to fill the vacancy.

Williams, B. M., has been appointed assistant city engineer of El Paso, Tex., succeeding J. W. Carter.

Wright, John B., commissioner of public works of Amsterdam, N. Y., has resigned.

The Massachusetts state civil service commission has approved the prospective appointment by Mayor George W. Faulkner, of Pittsfield, of Frank H. Baker as chief of police in that city to succeed Daniel P. Flynn, deceased, and has voted to give Mr. Baker a non-competitive examination as early as possible.

Important changes and promotions in the office forces of the State Highway Department of Pennsylvania at Harrisburg have been announced by State Highway Commissioner Cunningham.

L. L. Robbins, who has been the assistant engineer in charge of the district comprising Beaver, Westmoreland and Allegheny counties, has been removed and S. W. Jackson, who has been in charge of the district comprising Bradford, Cameron, Lycoming, Sullivan, Potter and Tioga counties, has been placed in charge of Robbins' district. The vacancy thus created has been filled by the promotion of J. S. Ritchey, who has been county superintendent in Sullivan county, to the post of assistant engineer. Ritchey has been placed in charge of Jackson's old district. W. H. Mason has been appointed county superintendent to fill the vacancy caused by Ritchey's promotion.

The district comprising Berks, Carbon, Schuylkill, Lehigh and Northampton counties is now in charge of John T. Gephart, Jr., who succeeds G. C. Langenheim, removed.

Another important change is the removal of Thomas C. Boyd, of Pittsburgh, from the post of registrar of the automobile division and the ap-

pointment of George M. Brusstar, of Philadelphia, to succeed him. Brusstar formerly came from Reading, where he was in business for many years. Allen C. Frankel, of Pittsburgh, is removed and the vacancy thus made has been filled by the appointment of Ardie Steel, of Altoona, who has been employed in the office of the dairy and food commissioner. Brusstar is to receive a salary of \$1,500 a year, while Steel will get \$1,800. Both of these appointments were made on the recommendation of Governor Brumbaugh.

George W. Deaves, of Delaware county, has been appointed superintendent of that county, to fill the vacancy caused by the resignation of A. A. Sellers. B. F. Dively has been named to succeed E. L. Coveney as superintendent of Bedford county; C. E. Myers succeeds Robert Black as superintendent of Westmoreland county; W. G. Dick is the new superintendent of Allegheny county, and W. A. Dilzer has been named as superintendent of Berks county.

Following officials have been elected:

Saratoga Springs, N. Y.—Mayor, Walter P. Butler; commissioner of accounts, M. J. Mulqueen; commissioner of finance, W. H. Waterbury; commissioner of public works, N. R. Thompson; commissioner of public safety, William B. Millman.

Woodbury Heights, N. J.—Mayor, G. Harold Buzby; assessor, Alex Beith, Jr.; collector, Cyrus G. Biecher; constable, Harry Jones; justice of the peace, H. C. Hughes; council, Robert C. Shunk, Walter W. Shugard, William McCulloh, J. M. Beckett, Walter S. Curley and Walter Young.

Millville, N. J.—City clerk, John S. Horton; city solicitor, Louis H. Miller; city treasurer, George B. Worstall; city physician, Dr. Ralph R. Charlesworth; fire marshal, Paul T. Ludlam; city engineer, Newton B. Wade; tax collector, William H. Doling; members board of health, Harry Thomas and Charles Isibell.

Lonsdale, Tenn.—Mayor H. E. Christenberry; councilmen, E. F. Ammons, E. L. Ragsdale, J. O. Johnson, H. W. Murphy, J. M. Hinkle and W. W. Wells.

Long Beach, N. J.—Harry B. Riley, finance commissioner; George L. Hoodenpyl, city attorney; Frank M. Cates, public affairs commissioner; William T. Lisenby, public property commissioner; James R. Williams, public safety commissioner; C. J. Hargis, public works commissioner; Charles O. Boynton, auditor, and Carl V. Hawkins, police judge.

Hopkinton, R. I.—Town clerk Edwin R. Allen; town council, John S. Cole, Frank W. Crandall, John F. Palmer, Lafayette Edwards, Henry J. Wheeler; town treasurer, Silas R. Richmond; justices of the peace, Henry H. Crandall, Albert S. Babcock, William H. Burdick; assessors of taxes, George M. Crandall, Oscar Wells, George W. Avery, Alexander C. Kenyon, Stephen B. Andrews.

ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET AND ROADS				
O.	Columbus	Noon, June 26	Constructing 4,045 ft. road	F. S. Miller, Clerk.
Ind.	Terre Haute	June 26	Constructing gravel road	N. G. Wallace, Auditor
O.	Norwalk	10.30 a.m., June 26	Grading and improving several roads	E. E. Bowen, Clk. Trustees
O.	Wakeman	June 26	Paving with water bound macadam	E. E. Bowen, Clk. R. F. D. 1.
Ill.	Elgin	11 a.m., June 26	12,052 yds. brick pavement, 3,593 ft. concrete curb and gutter and 2,895 ft. concrete curb	M. H. Brightman, City Engr.
Minn.	Wadena	2 p.m., June 26	Constructing 2½ miles turnpike	Eugene Ross, Co. Aud.
Neb.	Papillion	Noon, June 26	Constructing conc. walks, cross walks and culverts	Geo. F. Oliver, Vil. Clk.
Wis.	Superior	2 p.m., June 26	Grading road and constructing culvert	C. J. Morisset, Co. Hwy. Comr.
Minn.	Litchfield	1 p.m., June 26	Grading and graveling state road	A. O. Palmquist, Co. Aud.
O.	Wyoming	Noon, June 27	Constructing cement sidewalk	G. H. Eversman, Vil. Clk.
N. Y.	Syracuse	10.30 p.m., June 28	Grading and paving streets	John N. Alsever, City Clk.
N. J.	East Orange	8 p.m., June 28	Lay. conc. sidewalks, excav. & fill. & lay. mac. & Belgian block paving	L. E. Rowley, City Clerk
Ill.	Chicago	11 a.m., June 28	Constructing cinder sidewalks on several streets	E. J. Glackin, Sec. B. L. I.
Wis.	Antigo	10 a.m., June 28	Constructing cement sidewalk	I. D. Steffen, Chr. B. P. W.
S. D.	De Smet	Noon, June 28	Grading one-tenth of a mile of road	Fred Brown, Clerk
Ia.	Oakland	June 28	11,000 yds. brick or concrete paving	J. H. Mayne, 235 Merrian Blk., Council Bluffs
Ind.	Portland	June 28	Surfacing with first class pavement to cost \$33,000	O. O. Clayton, City Engr.
O.	Cincinnati	Noon, June 28	Oiling roads	Philip Fosdick, Dir. P. S.
Ill.	Brockton	2 p.m., June 28	28,555 ft. crushed rock and gravel road	H. L. Beck, Town Clk.
Ill.	Cairo	11 a.m., June 28	24,162 yds. gravel macadam, 17,950 ft. curb and gutter, etc.	W. H. Ward, Pres. B. L. I.
N. Y.	New York	2 p.m., June 28	Regulating and paving with sheet asphalt, granite block. (5 jobs.)	M. M. Marks, Boro. Pres.
Mich.	Bay City	9 a.m., June 28	Constructing permanent pavement	E. E. Prohazka, Sec. B. W.
Minn.	St. Paul	10.30 a.m., June 28	Paving streets and constructing curbs	Aug. Hohenstein, Pur. Agt.
S. D.	Yankton	June 28	Sidewalks on several streets	J. W. Summers, City Aud.
O.	Columbus	Noon, June 28	Grading, draining and paving 22 streets	Geo. A. Borden, Dir. P. S.
O.	Toledo	10 a.m., June 28	Grading, draining and macadamizing	Lucas Co. Bd. of Comrs.
Wis.	Green Bay	10 a.m., June 28	Grading, curbing & guttering several streets	City Clerk
Wash.	Olympia	June 28	One mile of Pacific highway	State Highway Commission
Wash.	Everett	2 p.m., June 28	Constructing permanent highways	County Auditor
Mass.	Boston	Noon, June 28	Const. artificial stone sidewalk & lay. asph. or bitu. pav.	Patrick O'Hearn, Actg. Comr. Public Works
Minn.	Belle Plain	8 p.m., June 28	Large amount of cement walks, crossings, etc.	J. E. Townsend, Borough Clk.
Minn.	Hinckley	2 p.m., June 28	Clearing & ditching roads & constructing culverts	Charles Hansom, Twp. Clk.
Neb.	Arlington	6 p.m., June 28	Const. cement walk & street and alley crossings	J. C. Badgern, City Clk.
O.	Columbus	2 p.m., June 29	Constructing and repairing state roads	Clinton Collins, State Hwy. Comm.
Wis.	Madison	2 p.m., June 29	Paving with brick and improving streets	H. C. Buser, City Clerk
N. Y.	Scarsdale	June 29	4,600 yds. pavement and 39,400 sq. ft. brick sidewalk	Wm. Mercer, Town Sup. Hwys.
Utah	Salt Lake City	10 a.m., June 29	Constructing pavement and sidewalk extensions	K. A. Scheid, City Rec.
Ind.	South Bend	10 a.m., June 29	Street paving	Veronica C. Sweeney, Clk. of Board
Wis.	Merrill	4 p.m., June 29	Vit. brick pavement on concrete base (2 jobs)	W. J. Keyes, City Clk.
O.	Grand View H'ghts	Noon, June 29	Grad. & pav. with mac. & curbs, gut. & sidewalks of conc.	T. G. Constable, Vil. Clk.
O.	Toledo	June 29	Grad., drain. and surf. with water bound mac. or bitu. binder; also gravel road	County Commissioners
O.	Malvern	June 29	Brick pav., 29,650 sq. yds. on natural gravel foundation, cement grout filler, 13,740 ft. conc. or stone curb, 745 ft. circular curb, 1,520 headers, 48 catch basins, 2,570 ft. 12-in. sewer	J. G. Murdson, Clerk
Minn.	Fairmont	8 p.m., June 29	Laying 24,000 yds. paving & 6,000 ft. curbing	H. B. Tuttle, City Clerk.
O.	Upper Sandusky	11.30 a.m., June 29	Grading and stoning road	J. Marguerat, Co. Aud.
N. D.	Bowbells	2 p.m., June 29	Constructing grade	G. K. Melby, Aud. Co.
Wash.	Seattle	June 29	Grading and graveling permanent highway, cost \$20,000	Byron Phelps, Co. Aud.
Ky.	Carlisle	June 29	Reconstructing 16 miles turnpike, to cost \$35,000	J. F. Sugg, Court Clk.
Del.	Wilmington	June 29	Furnishing and applying oil and bituminous material on stone road	Jas. Wilson, Co. Engr.
Conn.	Meriden	June 29	Paving with wood block, vit. block and reinforced conc.	Board of Public Works.
Me.	Augusta	11 a.m., June 30	780 yds. granite blk. paving and 2,222 yds. concrete paving	State Hwy Comm.
O.	Coshocton	noon, June 30	8,950 yds. brick paving	Elmer Smith, Dir. P. S.
Ill.	Mays Station	2 p.m., June 30	15,700 ft. gravel road and 5 concrete culverts	Cliff Andrews, Town Clk.
Conn.	Stamford	June 30	25,550 yds. paving	Paul Nash, City Engr.
N. J.	Trenton	June 30	26,000 yds. asphalt concrete, 1,500 yds. vit. brick gutters, 4,000 ft. concrete curb, etc., probable cost \$50,000	Frank Thompson, City Clk.
N. Y.	Buffalo	Noon, June 30	Constructing concrete walks	Geo. H. Selkirk, Sec. Park Comrs.
Fla.	De Land	June 30	35.96 miles roadway and 17.47 miles either brick, street asph., asph. conc., modified asph., asph. mac. or shell	Sam. D. Jordan, Clk. Co. Commissioners
Ind.	Marion	July 1	Street paving	City Clerk
O.	Portsmouth	July 1	Paving with brick	City Clerk
O.	Oak Hill	July 1	Curbing and paving; road construction	City Clerk
Ind.	Liberty	2.30 p.m., July 1	Grading, paving and improving road	G. W. Wray, Co. Aud.
Mo.	Chillicothe	July 1	2,500 ft. brick block paving on concrete base	J. W. Williams, City Aud.
N. J.	Newark	2.15 p.m., July 1	2,400 yds. asphalt pavement, curbs, gutters, etc.	M. R. Sherrerd, Ch. Engr.
Ind.	Richmond	10 p.m., July 1	Improving and paving with cement	Board of Public Works.
Pa.	Waynesburg	July 1	Street paving	Borough Council.
Ind.	Evansville	10 a.m., July 1	Constructing rock road	C. P. Beard, Co. Aud.
Pa.	Lebanon	5 p.m., July 1	4,000 yds. paving between car track; 20,700 yds. (two jobs) paving	T. R. Crowell, City Engr.
Neb.	Ord	7 p.m., July 1	Constructing cement walk and crossings	O. P. Cromwell, City Clk.
Neb.	Kearney	2 p.m., July 2	Street paving	T. N. Hartzell, City Clk.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Minn.	Duluth.....	10 a.m., July	2.. Street improvement	W. H. Borgen, Clk.
Pa.	Philadelphia	July	2.. Improving Broad St. Plaza.....	M. L. Cook, Dir. Pub. Wks.
Pa.	Glenlyon	7 p.m., July	2.. Surfacing with stone 4,460 ft. road.....	W. O. Davis, Sec. of Twp.
N. J.	Rutherford.....	8.15 p.m., July	2.. Laying waterbound macadam on two streets.....	F. A. Stedman, Boro. Clk.
Minn.	Granite Falls.....	10 a.m., July	2.. Constructing state rural hwy., estimated cost \$37,543.20.....	G. H. Wilson, Co. Aud.
Minn.	Granite Falls.....	2 p.m., July	3.. Furnishing 93 corrugated iron culverts.....	G. H. Wilson, Co. Aud.
Md.	Frederick	July	3.. 2.87 miles state aid road construction.....	County Comrs.
R. I.	Tiverton	July	3.. Macadamizing road	Town Clerk.
Wash.	Vancouver	July	3.. Macadamizing 21,000 ft. road to cost \$35,000.....	County Commissioners.
Md.	Frederick	July	3.. 1.04 miles state aid highway	J. W. Holter, Pres. Co. Comrs.
Miss.	Hazlehurst	July	5.. Gravel road construction to cost \$160,000.....	Xavier A. Kramer, Engr., Magnolia.
Ind.	Jeffersonville.....	July	5.. Constructing crushed stone road.....	E. W. Stoner, Co. Aud.
Ind.	Williamsport.....	2 p.m., July	5.. Grading, paving and improving roads.....	D. H. Moffitt, Co. Aud.
Ind.	Jasper	2 p.m., July	5.. Grading, paving and improving road.....	Jacob H. Seng, Co. Aud.
Ind.	Rushville	2 p.m., July	5.. Grading, paving and improving road.....	A. R. Holden, Co. Aud.
Ind.	Brownstown.....	1.30 p.m., July	5.. Grading, paving and improving roads.....	Albert Leudtke, Co. Aud.
Ind.	Greensburg.....	1 p.m., July	5.. Grading, paving and improving roads (2 jobs).....	L. W. Sands, Co. Aud.
Ind.	Logansport.....	10 a.m., July	6.. Grading, draining and paving road.....	A. P. Flynn, Co. Aud.
Ind.	Rensselaer.....	2 p.m., July	6.. Grading, paving and improving road.....	J. T. Hammond, Co. Aud.
Minn.	West Minn.....	7.30 p.m., July	6.. Constructing cement sidewalk.....	E. A. Close, Vil. Rec.
Ind.	Fowler.....	1 p.m., July	6.. Grading, paving and improving road.....	Warren Mankey, Co. Aud.
Ind.	English.....	2 p.m., July	6.. Grading, paving and improving road.....	J. B. Enlow, Co. Aud.
Minn.	Eveleth.....	8 p.m., July	6.. 9,000 sq. ft. conc. sidewalk & 2,000 lin. ft. conc. curb & gut.	C. H. Williams, City Clk.
O.	Hamilton.....	Noon, July	6.. Street paving	City Clerk
Ind.	Crawfordsville.....	July	6.. Grading, draining and paving road.....	B. B. Engle, Co. Aud.
Ind.	Madison.....	1 p.m., July	6.. Grading, paving and improving road.....	W. L. Benson, Co. Aud.
Tex.	Corsicana.....	Noon, July	6.. Improving streets with bitulithic, brick, asphaltic concrete or asphaltic macadam.....	J. A. Harper, City Secy.
N. D.	Linton.....	4 p.m., July	6.. 7,000 yds. grading.....	J. R. Snyder, Co. Aud.
Minn.	Sleepy Eye.....	8 p.m., July	6.. Cement street and alley crossing.....	H. C. Peterson, City Rec.
Minn.	Duluth.....	9.30 a.m., July	6.. Eight jobs of road work.....	O. Halden, Co. Aud.
Ind.	Columbus.....	10 a.m., July	6.. Grading, paving and improving road.....	W. H. Scott, Co. Aud.
Ala.	Fayette	July	6.. Graveling and improving road	County Commissioners.
Ga.	Trenton	Noon, July	6.. Road improvements	C. S. Turner, Sec. Rd. Comrs.
Ind.	Rockville	July	6.. Draining and graveling road.....	Chas. Davis, Co. Aud.
O.	Lockland	Noon, July	6.. Paving with brick.....	Ray Wiley, Vil. Clk.
Wash.	Seattle	July	6.. Grading and graveling two miles to cost \$18,000.....	County Commissioners.
La.	Mansfield	Noon, July	6.. 10,130 yds. first-class paving, 3,500 ft. curbing and 560 ft. storm sewers.....	D. C. Houston, Town Clk.
Minn.	Hopkins	July	6.. Constructing concrete walks for ensuing year.....	E. A. Close, Vil. Recorder.
N. Y.	Albany.....	1 p.m., July	7.. Repairing highways in 21 counties.....	Edwin Duffey, State Hwy. Comr.
O.	Port Clinton.....	Noon, July	7.. Grad., curb. with concrete & pav. with concrete.....	W. H. Williamson, Vil. Clk.
Neb.	Grand Island.....	July	7.. Street paving to cost about \$30,000.....	City Engineer
Ind.	Winchester.....	10 a.m., July	7.. Grading, paving and improving road.....	C. E. Tilson, Co. Aud.
Pa.	Pittsburgh.....	10 a.m., July	8.. Improving road	Board of Co. Comrs.
O.	Cincinnati.....	Noon, July	9.. Road improvements	Albert Reinhardt, Clerk
Wis.	Racine	10 a.m., July	10.. 2,420 yds. brick paving, 1,150 ft. concrete curb and gutter and 170 ft. of concrete gutter.....	P. H. Connolly, City Engr.
Pa.	Allentown	July	12.. Street work	Bascom & Sieger, Twp. Engrs.
Wash.	Olympia	July	12.. Constructing 15 miles road, cost \$38,000.....	State Highway Dept.
N. J.	Milburn.....	8 p.m., July	12.. Grading, draining and paving street.....	William Byrd, Chr. Towp Comm.
Pa.	Pittsburgh.....	1.30 p.m., July	12.. County highway tunnel.....	A. D. Neeld, Cons. Engr., 237 4th Ave.
Ala.	Tuskegee	July	13.. Grading, draining and graveling roads.....	W. S. Keller, State Hwy. Engineer, Montgomery.
N. Y.	Albany.....	1 p.m., July	13.. Improving & repairing about 93 miles highways.....	Edwin Duffey, State Hwy. Comr.
Fla.	Winter Park	July	13.. Curbing and constructing cement sidewalk.....	Percy Dale, Clk.
Tex.	Kaufman.....	1 p.m., July	13.. Const. sys. of permanent rds. & bridges to cost \$150,000.....	J. A. Cooley, Co. Judge
N. Y.	Albany.....	1 p.m., July	15.. Const. & repairing about 50 miles of highways.....	Edwin Duffey, State Hwy. Comr.
O.	New Albany.....	Noon, July	15.. Constructing sidewalks	F. M. Heischman, Clerk
Ia.	Oelwein.....	July	20.. First-class paving on thirty blocks.....	G. H. Bishop, City Eng.
Ind.	Noblesville.....	10 a.m., July	20.. Constructing county line road	W. O. Horton, Co. Aud.
Ia.	Spencer.....	July	24.. Laying 50,000 yds. first-class pavement.....	E. O'Keefe, City Engr.
O.	Tiffin	July	25.. 25,800 sq. yds. brick and crushed stone or concrete base, 15,600 ft. sandstone or concrete curb, excavation, etc., for four streets.....	O. J. Oberlander, City Engr.
SEWERAGE				
O.	Lima.....	June	26.. 2,660 ft. of sewer construction (3 jobs).....	Joseph Askins, Dir. P. S.
Ind.	Anderson.....	10 a.m., June	26.. Ditch construction to cost \$8,233.60.....	Brice Dille, Supt.
Minn.	Wadena.....	2 p.m., June	26.. County ditch construction.....	Eugene Ross, Co. Aud.
Wis.	Watertown.....	2 p.m., June	26.. 450 ft. 10-in., 1,531 ft. 20-in., 1,360 ft. 24-in., sewer pipe and 32 ft. 24-in. metal pipe.....	Board of Public Works
Wis.	Waupaca.....	4 p.m., June	26.. Constructing 5,906 ft. 8-in. vitrified or cement sewer.....	City Clerk
Ia.	Council Bluffs.....	8 p.m., June	28.. Sewer wk., includ. 16,812 ft. 6-in. sewer, 16,080 ft. 8-in., 14,495 ft. 10-in., 14,690 ft. 12-in., 3,335 ft. 15-in., 123 manholes and 666 Y's.....	C. J. Duff, City Clk.
Minn.	Buffalo	2 p.m., June	28.. Drainage ditch construction.....	J. A. Berg, Co. Aud.
N. Y.	Syracuse.....	1.30 p.m., June	28.. Constructing 8 and 10-in. pipe sewers.....	J. N. Alsever, City Clk.
Mo.	Kirksville	7 p.m., June	28.. Constructing storm sewers.....	C. V. Dowling, City Engr.
O.	Columbus.....	Noon, June	29.. Constructing storm sewers.....	G. A. Borden, Dir. P. S.
Minn.	Glencoe.....	7 p.m., June	29.. Sanitary sewer system and disposal plant.....	Peter Hatz, Vil. Clk.
Minn.	Roseau.....	10 a.m., June	29.. Digging and constructing drainage ditch.....	S. G. Bertilrud, Co. Aud.
Wash.	Port Angeles	June	29.. Constructing sewer system, cost \$50,000.....	J. L. Beam, City Clk.
Ia.	Newton	June	29.. Constructing sewage disposal plant	E. G. Finch, City Clk.
N. J.	New Brunswick.....	10 a.m., June	29.. Laying sewers in five streets.....	Asher Atkinson, City Engr.
Minn.	Morris	10 a.m., June	29.. County ditch construction, cost \$15,000.....	C. R. Wolltham, Co. Aud.
O.	Columbus	noon, June	29.. Constructing improved sewage treatment works	G. A. Borden, Dir. P. S.
Mass.	Boston	Noon, June	29.. Constructing pipe sewers and drains.....	Patrick O'Hearn, Actg. Sup. Public Works
Wis.	Kohler.....	8 p.m., June	30.. Constructing sanitary sewer.....	Otto Krepsky, Pres. Vil. Bd.
N. C.	Winston-Salem.....	June	30.. Change of date for constructing sewer and sewage disposal plant	J. L. Ludlow, Engr.
Fla.	Bartow.....	1.30 p.m., July	1.. Constructing about 142 miles drainage ditches.....	Benjamin Getzoff, Asst. Secy.
Ky.	Madisonville.....	July	1.. Constructing 8,666 ft. sanitary sewers	J. M. Flannigan.
O.	Brewster.....	Noon, July	2.. Sewer construction	Village Clerk
Wis.	Elroy.....	7.30 p.m., July	6.. Furn. & lay. 1,140 ft. 10-in. & 857 ft. 8-in. vit. pipe sewers, 6 manholes, 2 catch basins, etc.....	William Flood, City Clk.
La.	Mansfield.....	Noon, July	6.. Constructing 560 ft. storm sewers.....	E. E. Swope, Twn. Engr.
La.	Sulphur.....	Noon, July	7.. Constructing 15 miles open ditches.....	F. Shotts & Son, Lake Charles
Ill.	East St. Louis.....	2 p.m., July	7.. Constructing outlet sewer.....	G. L. Tarlton, Pres. Bd. Trust.
N. Y.	Binghamton.....	July	7.. Constructing sewers	City Clerk
La.	Westlake	Noon, July	7.. Constructing 15 miles open ditches.....	W. H. Managan, Pres. Drnge. Dist. No. 2.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Kan.	Ozawkie.....	10 a.m., July	8.. Constructing drainage ditches and cutoffs.....	H. O. Ploughe, Secy.
Pa.	Eddystone.....	July	12.. Laying 8-in. terra cotta sewer	J. A. Campbell, Clk. of Council.
O.	Columbus.....	Noon, July	16.. Disposal plant and sewer system for Infirmary.....	John Scott, Clk. Co. Comrs.
WATER SUPPLY				
Neb.	Papillion	8 p.m., June	26.. Const. pump house, driving wells & laying water mains..	G. F. Oliver, Vil. Clk.
D. C.	Washington.....	Noon, June	26.. Furnishing 300 tons sulphate of alumina.....	U. S. Engineer, Southern Bldg.
Pa.	Eddystone	3 p.m., June	28.. 2,000,000-gallon settling basin, boiler, standpipe, pipe, etc..	M. C. Michener, Chr. Wat. Com.
N. J.	East Orange.....	8 p.m., June	28.. Cast iron pipe and special castings.....	A. A. Reimer, Sec. Water Comrs.
O.	Euclid	Noon, June	28.. 6-inch water main	H. S. Dunlop, Vil. Clk.
O.	Rittman	June	29.. Constructing water works; furnishing pumping equip...	Vance Hicken, Clk. of Village Council.
Ill.	Chicago.....	11 a.m., June	30.. Pumping machinery and auxiliaries.....	W. R. Moorhouse, Comr. P. W.
W. Va.	St. Marys	Noon, June	30.. Constructing 330,000 gal. concrete reservoir.....	E. J. Miller, City Engr.
Kan.	Pratt.....	1 p.m., June	30.. Water works improvements, including laying pipe, resetting old pump and installing new.....	N. P. Jones, City Clerk
Wis.	Kohler.....	8 p.m., June	30.. Constructing waterworks system.....	Otto Krepsky, Pres. Vil. Bd.
Md.	Baltimore	June	30.. 20,000,000-gal. centrifugal pump and electrical power Equipment	E. B. Whitman, Cons. Engr.
O.	Columbus.....	July	1.. Dam, waste weir & flood regulation gates at reservoir..	J. I. Miller, Supt. P. W.
Ind.	Batesville.....	2 p.m., July	2.. Const. earth dam & pump. sta., lay. 5,000 ft. 8-in. pipe & erecting 9,000 ft. electric transmission line.....	Supt. of Waterworks
Minn.	Thief R. Falls..	8 p.m., July	6.. Furn. material & constructing waterworks system.....	E. J. Overland, City Clk.
Ia.	Decorah.....	7.30 p.m., July	7.. Laying water mains.....	F. M. Hughes, City Clk.
N. Y.	New York	11 a.m., July	7.. Pumping and drainage equipment for city tunnel of Catskill aqueduct; racks, shutters, screens, etc., for reservoirs	Principal Asst. Engr., Bd. Water Supply.
Ky.	Covington	July	8.. 3,607 tons cast-iron pipe and 20 tons specials.....	J. M. Howk, Comr. Pup. Prop.
O.	Columbus	2 p.m., July	8.. Constructing dam, waste weir and flood regulation gates at reservoir	J. I. Miller, Supt. Pub. Wks.
Porto Rico	San Juan.....	10 a.m., July	9.. Constructing 70,000-gal. steel standpipe or tank.....	Quartermaster
Va.	Covington	July	12.. Furnishing cast iron pipe and constructing reservoir.....	Harry Stephens, Engr., Union Tr. Bldg., Washington, D. C.
India	Madras.....	July	14.. Furnishing c. i. pipe, hydrants and valves.....	President of Corporation
LIGHTING AND POWER				
Mont.	Miles City.....	June	28.. Furnishing materials and constructing steam heating mains	Paul Allmayer, City Clk.
Tex.	Houston.....	10 a.m., June	28.. Furn. county building with light globes for one year....	H. L. Washburn, Co. Aud.
Minn.	Owatonna.....	2 p.m., June	29.. Constructing power house for state school.....	State Bd. of Control, St. Paul
Kan.	Gaylord.....	June	30.. Constructing electric light plant.....	S. R. Stephenson, Mayor
Ind.	Richmond	10 a.m., July	1.. 250 ft. 2½-in. hose.....	Board of Pub. Wks.
D. C.	Washington.....	July	3.. Extension to bldg. & install. new equip. at boiler plant.	Bu. of Yds. & Docks, N. Dept.
N. J.	Rochelle Park.....	July	5.. Street lighting for five years.....	Comrs. of Light Dist. No. 1
Wash.	Olympia	July	7.. Furnishing electrical power to city.....	W. A. Hoage, City Clk.
Cal.	Chico	July	7.. Constructing power house for Normal School.....	W. T. McClure, City Engr., Sacramento.
O.	Coshocton	July	10.. Installation of cluster lights	County Auditor.
Mo.	Chillicothe.....	2 p.m., July	15.. Constructing electric light plant.....	J. A. Ryan, Sec. City Council
Okla.	Adamson.....	Sept.	20.. Electric light plant.....	Frank Mann, Engr.
FIRE EQUIPMENT				
O.	Cleveland.....	Noon, June	26.. 2,000 ft. hose, couplings and nozzles.....	H. H. Bohning, Vil. Clk. for South Newburgh
Mich.	Detroit.....	2.30 p.m., June	28.. Engines and equipment for fire department.....	G. J. Finn, Sec. Fire Comm.
N. Y.	New York	10.30 a.m., June	28.. Furnishing and applying 26 2-wheel gasoline driven tractors	Robt. Adamson, Fire Comr.
Mich.	Saginaw	June	29.. Motor-dr. comb. & motor-dr. city service truck.....	H. F. Paddock, Comr. Health & Safety
N. Y.	New York	10.30 a.m., June	30.. 20,000 ft. 2½-in. and 10,000 ft. 1½-in. rubber-lined hose..	Robt. Adamson, Comr.
N. C.	Southport.....	8 p.m., June	30.. 1,500 ft. rubber-lined hose and three reels.....	H. P. O'Hagan, City Engr.
Pa.	Glenlyon	7 p.m., July	2.. Fire alarm system.....	W. O. Davis, Sec. of Twp.
Ind.	Shelbyville.....	11 a.m., July	6.. Erecting fire escapes on Orphans' Home.....	F. W. Fagel, Co. Aud.
England	London.....	August	11.. Installing fire alarms at Rangoon.....	Ogilvy Gillanders & Co., 67 Cornhill, E. C.
BRIDGES				
Ore.	Clatskanie	June	26.. Steel bridge to cost \$20,000.....	L. J. Van Orshovem, Co. Engr.
Ind.	Sullivan	June	26.. Constructing six concrete and three steel bridges.....	W. S. Bicknell, Co. Aud.
W. Va.	Williamson	June	26.. Bridge construction	J. S. Hall, City Recorder.
N. J.	Pine Brook	11.30 a.m., June	28.. Rebuilding bridge over Passaic River	Wm. E. King, Morristown.
O.	Lebanon	11 a.m., June	28.. Erecting steel bridge	J. M. Mulford, Co. Aud.
Wash.	Seattle	June	28.. Steel bridge to cost \$18,000.....	City Commissioners.
N. Y.	Scarsdale.....	2 p.m., June	28.. Steel plate girder highway bridge over railroad tracks..	William Mercer, Supt. Hwys.
Ill.	Rockford	June	28.. Concrete bridge, estimated cost \$13,000.....	H. J. Gallagher, Chr. Street & Alley Comm.
Pa.	Sunbury.....	11 a.m., June	28.. Constructing reinforced bridge.....	Aaron Raker, Co. Cont.
Wash.	Everett	2 p.m., June	28.. Bridge construction.....	County Auditor.
Pa.	Allentown	10 a.m., June	28.. Constructing and repairing bridges.....	H. C. Wienert, Clk. Co. Com.
O.	Lebanon.....	June	28.. 160 ft. high truss steel bridge, creosoted block floor and concrete abutments	John M. Mulford, Co. Aud.
Mo.	St. Louis	Noon, June	29.. Steel for Mississippi River bridge.....	E. R. Kinsey, Pres. B. P. S.
Ill.	Mays Station.....	2 p.m., June	30.. Wing walls, abutments and culverts.....	Cliff Andrews, Town Clk.
Ill.	Clinton	2 p.m., June	30.. Concrete box culverts to cost \$375.....	County Clk.
O.	Cincinnati	noon, June	30.. Reconstructing several bridges	Philip Fosdick, Dir. P. S.
N. C.	High Point	July	1.. 300-ft. and 150-ft. steel bridges	B. D. Hammond, Gen. Mgr., P. O. Box 21, Boston.
La.	Lake Charles.....	July	1.. Reinforced conc. bridge, costing \$100,000.....	Police Jury
O.	Cincinnati.....	Noon, July	2.. Retaining wall and steel plate for bridges.....	F. E. Wessellman, Pres. Bd. Hamilton Co. Comrs.
O.	Columbus.....	2 p.m., July	2.. Building levee embankment and concrete culverts.....	J. I. Miller, Supt. P. W.
Mo.	Kahoka.....	Noon, July	2.. Constructing five bridges.....	County Clerk
Minn.	Cannon Falls.....	2 p.m., July	2.. 180-ft. span and 140-ft. span reinforced concrete bridges..	Geo. Wilson, City Clk.
O.	Cleveland	July	3.. Paving bridge and approaches.....	W. A. Stinchcomb, Co. Surv.
Wash.	Colfax	July	5.. Constructing three bridges, cost \$9,800.....	J. M. McCaw, Co. Engr.
Miss.	Columbia	July	5.. Constructing four steel bridges and three concrete culverts	G. E. Hauser, Jr., Engr.
Miss.	Gulfport	July	5.. Constructing bridge across Biloxi River.....	J. J. Murphy, Clk.
Ind.	Hartford City.....	2 p.m., July	5.. Constructing concrete bridge	J. L. McGeath, Co. Aud.
Cal.	San Jose	11 a.m., July	6.. Constructing reinforced concrete bridges	Henry A. Pfister, Clk.
W. Va.	Milton	July	6.. Concrete work for bridge	Oliver & Maupin, Engrs., Huntington.
W. Va.	Rainelle	July	6.. Constructing three reinforced concrete or steel bridges....	J. F. Crawford, Clk. Co. Court, Lewisburg
Wash.	Colfax	July	6.. Four concrete bridges, 25 to 60-foot span.....	J. M. McCaw, Co. Engr.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Cal.	Orange	July 6	Constructing reinforced concrete bridge to cost \$10,000	Board of City Trustees.
Minn.	Minneapolis	10 a.m., July 6	Bridge construction	Al. P. Erickson, Co. Aud.
Ind.	Logansport	10 a.m., July 6	Constructing flat top culverts	A. P. Flynn, Co. Aud.
S. D.	Bellefourche	Noon, July 6	Culvert pipe	M. P. Lange, Co. Aud.
O.	Norwalk	10.30 a.m., July 6	Constructing concrete bridge	C. E. Bloomer, Co. Clk.
Cal.	Hanford	July 6	Constructing reinforced concrete bridge	Clk., Bd. of Supv.
N. D.	Hankinson	2 p.m., July 6	Constructing 9 steel bridges	F. A. Burton, Co. Aud.
Cal.	Santa Ana	July 6	Bridge	City Trustees
Ore.	Gold Beach	July 7	Reconstructing Elk River bridge	J. M. Causwell, Co. Engr.
O.	Massillon	10 a.m., July 7	Constructing substructure of bridge	C. L. Stoner, Clk. Co. Comrs.
Wash.	Olympia	July 7	80-ft. reinforced concrete arch bridge	State Highway Commission.
N. D.	Bismarck	2 p.m., July 8	Constructing seven reinforced concrete culverts	T. E. Flaherty, Co. Aud.
N. D.	Jamestown	July 8	Constructing reinforced concrete culverts	Andrew Blewitt, Co. Aud.
O.	Cincinnati	Noon, July 9	Concrete arch culvert	Albert Reinhardt, Clk. Co. Comrs.
Ala.	Montgomery	July 12	Steel bridge construction	Thos. H. Edwards, Co. Engr.
N. J.	N. Brunswick	2.30 p.m., July 12	Constructing reinforced concrete bridge	A. E. Fox, Co. Engr., Perth Amboy
Minn.	Albert Lea	2 p.m., July 12	Constructing 15-ft. reinforced concrete bridge	Fred Tavis, Co. Aud.
O.	Youngstown	10 a.m., July 14	Repairing and rebuilding bridge paving	Frank H. Vogan, Co. Clk.
Ida.	Silver City	2 p.m., July 14	Constructing wagon bridge	J. S. St. Clair, Clk. Co. Comms.
S. D.	Williston	1.30 p.m., July 15	Bridge construction	M. H. Aaen, Co. Aud.
Wash.	Seattle	10 a.m., July 23	Two drawbridges to cost \$880,000	Board of Public Works.
MISCELLANEOUS				
Ill.	Chicago	11 a.m., June 26	2-ton electric truck	Ray Palmer, Comr. Gas & Elec.
Ill.	Chicago	June 26	Six jib cranes	L. E. McGann, Comr. P. Wks.
Fla.	Brooksville	June 26	Rock crushing outfit	M. H. Snow, Clk. Co. Comrs.
Tenn.	Memphis	June 26	700,000 cu. yds. levee work	Mississippi River Comm.
Tex.	Beaumont	June 28	Constructing 128-ft. timber dam	J. S. Weed, Engineer.
Miss.	Meridian	June 28	Furniture for city hall	City Council.
Tex.	Galveston	11 a.m., June 28	Furnishing automobile runabout	J. M. Murch, Co. Aud.
Minn.	St. Paul	10.30 a.m., June 28	1,450 cu. yds. stone and 2,480 bbls. Portland cement	Aug. Hohenstein, Pur. Agt.
Va.	Roanoke	June 29	Motor street sweeping machines	P. H. Tucker, City Clk.
Tenn.	Memphis	Noon, June 29	16,000 cu. yds. riprap stone	Maj. E. M. Markham, U. S. Engr.
Tex.	Marlin	June 29	Constructing county jail to cost \$25,000	County Comrs.' Court
Tenn.	Memphis	11 a.m., June 30	20,000 yds. riprap stone	Maj. E. M. Markham, U. S. Engr.
Ga.	Atlanta	June 30	Oil or gasoline traction engine	C. M. Holland, Co. Pur. Agt.
Mont.	Great Falls	2 p.m., July 1	Canals and structures on Sun River project	U. S. Reclamation Service
N. Y.	New York	Noon, July 1	Furnishing trailer compartment & rubbish boxes	J. T. Fetherston, Comr. St. Cleaning
O.	Middletown	2 p.m., July 2	Levee embankment, culvert and spillway repairs	J. I. Miller, State Supt. P. W.
N. J.	Bloomfield	8 p.m., July 5	5,000 tons broken stone	R. F. Davis, Town Clk.
N. D.	Bismarck	July 6	Five 600-gal. wagon oil tank	T. E. Flaherty, Co. Aud.
N. Y.	New York	12.15 p.m., July 9	Installing track on Rapid Transit Railroad	Public Service Commission
D. C.	Washington	July 9	Constructing complete Post Office at Beardstown, Ill.	J. A. Wetmore, Supv. Archt.
D. C.	Washington	July 10	5,000 bbls. Portland cement	F. H. Duehay, Supt. Prisons
Australia	Sydney	July 12	Two steam turbines with condensers, pumps, etc.	Metropolitan Board of Water Sup. & Sewerage, 341 Pitt St.
D. C.	Washington	July 14	Constructing complete Post Office at Opelika, Ala.	J. A. Wetmore, Supv. Archt.
S. C.	Charleston	July 15	Wharf construction	H. L. Beck, Lighthouse Insp.
D. C.	Washington	July 23	Const. complete of U. S. Post Office at Webb City, Mo.	J. A. Wetmore, Act. Supv. Archt.
Australia	Adelaide	Aug. 24	Steel self-propelling barge loading bucket dredger	South Australian Harbor Bd.

STREETS AND ROADS

Anniston, Ala.—Commissioners of this county are also planning to construct 4 miles of macadamized road between Jacksonville and Piedmont, which will connect those two cities with one of best roads in state.

Douglas, Ariz.—The formation on a street paving district on G Ave. and 10th St. is being planned.

Phoenix, Ariz.—Urging an early election for purpose of voting \$500,000 for good roads, delegations from all parts of Cochise county have met at Tombstone with Board of Supervisors.

Safford, Ariz.—Work will start at once on new road between San Carlos and Gila River bridge, as citizens and boards of supervisors of Graham and Gila Counties have posted a \$15,000 bond and released U. S. government from any responsibility in connection with proposed new road. The new road will be 11 miles long.

Fresno, Cal.—First legal steps for calling of bond election in Fresno County to bond county for \$3,000,000 for system of permanent good roads, have been taken when directors of Chamber of Commerce filed petition with 3,000 signatures. It is purpose to construct series of laterals to trunk line of state highway, which passes through center of county, that will also connect all county towns with county seat.

Los Angeles, Cal.—Ordinance has been adopted for improvement of Andrews Boulevard between 6th St. and a line 600 ft. North by paving.

Oak Park, Cal.—Resident property owners of Cypress Ave. will meet again for purpose of urging City Street Department to call up improvement of that thoroughfare between two Stockton Rds.

Oroville, Cal.—City trustees have ordered plans and specifications prepared for paving Montgomery St. from Lincoln St. to Fourth Ave.

Pasadena, Cal.—Gov. Johnson has signed Fish bill to appropriate \$7,500 for preliminary survey of proposed Pasadena state highway from La Canada up Arroyo Seco to Antelope Valley.

Sacramento, Cal.—City commission has adopted plans and specifications for improvement of Front St., from N to Q, with basalt blocks, and for Front, from Q to S, with 6-in. asphalt pavement.

San Francisco, Cal.—Board has resolved to pave north half of Fulton St., between 28th and 37th Aves., the cost being estimated at \$16,150, and Balboa St., between 13th and 14th Aves.

San Jose, Cal.—Bids supposed to be competitive, made by four different cement companies, for contract to supply 50,000 barrels of cement for county highway work, tallied in every one of 22 individual items, when read before Supervisors. Board voted to reject all bids. The bids were made by following firms: Standard Portland Cement Co.; Pacific Portland Cement Co., consolidated; Henry Cowell Lime and Cement Co., and the Santa Cruz Portland Cement Co.

Bridgeport, Conn.—It is expected by Mayor Wilson that resurfacing of Main St., from North Ave. to Trumbull line, will be started about middle of July, and that entire work will be completed by August 1.

Stamford, Conn.—City engineer has been directed to lay about 125 sidewalks in various parts of city.

Melbourne, Fla.—One hundred and fifty thousand dollars good roads bond issue for Third district, Brevard County, carried by vote of 2 to 1 at election. This action assures completion of west branch of Dixie highway from Kissimmee connecting East Coast route at this place and cross state highway to Tampa.

Melbourne, Fla.—Third district in Brevard County, the Melbourne district, voted a bond issue of \$150,000 for good

roads. Vote for bonds was two to one. This assures paving of another link in great highway rapidly being built down East Coast through the various counties as the East Coast highway will be paved from Melbourne south to St. Lucie County line.

Elgin, Ill.—Bids will be received by City until 11 a. m., June 26, 1915, for paving and otherwise improving part of North State St., including 12,062 sq. yds. brick pavement on 5-in. concrete foundation, 3,593 lin. ft. cement concrete combined curb and gutter, and 2,895 lin. ft. cement concrete curb. Morgan H. Brightman is engineer.

Springfield, Ill.—The paving with asphalt of 6th St. from South Grand Ave. to North Grand Ave. and installation throughout of ornamental lighting system is to be authorized by City Council in near future, unless unforeseen obstacles interfere.

Crown Point, Ind.—An issue of \$57,400 Lake County road bonds has been sold to First National Bank of this city for premiums of \$30. Interest 4½ per cent.

Huntington, Ind.—Sealed bids for \$46,184 in bonds of three roads in Huntington County will be received by A. H. Shaffer, county treasurer, June 28. Bonds are those of Smelser road in Wayne Township, the Vachon & Rarick road in Rock Creek Township and the McKeever road in Dallas Township. The amounts are respectively, \$4,192, \$25,265 and \$16,727.

Indianapolis, Ind.—Resolution for paving Graceland Ave., from 40th to 42d Sts., has been adopted by Board of Public Works. Estimated cost is \$14,301.

Kokomo, Ind.—Board of works has received bids on Waugh St. walks. Landon & Shinn bid 13½ cts.; L. T. Record, 12 cts., and H. H. Stewart, 13 cts. Bids were referred to city engineer. Plan for Defenbaugh St. were modified

to provide for 6-ft. walks and 36½-ft. roadway.

Muncie, Ind.—City Engineer B. F. Dear-dorff has been instructed by special committee of Council to draw up plans and specifications for construction of macadam roadway and cement curb and gutter on Vine St., between Main and Jackson Sts., and for construction of cement curb and gutter on First St., from Mound St. to Kilgore Ave.

Richmond, Ind.—Paving of Sheridan St. with concrete is being planned.

Clinton, Ia.—Resolution has been adopted for construction of large number of sidewalks.

Keokuk, Ia.—Paving and curbing of 16th St. has been ordered.

Glascow, Kan.—It is planned to pave main street of Glascow with concrete. Plans and specifications were prepared by State Engineer W. S. Gearhart, Manhattan, Kan.

Leavenworth, Kan.—Ordinance has been passed providing for regrading and paving of 2d Ave. from south line of Marshall St. to south line of Pennsylvania St., in City of Leavenworth. Ordinance has also been passed declaring it necessary to construct certain sidewalks.

Covington, Ky.—Reconstruction of Lexington pike with concrete is urged.

Frankfort, Ky.—The \$250,000 road bond issue of Whitley County has been declared valid by Court of Appeals, affirming Whitley Circuit Court.

Middlesboro, Ky.—J. H. S. Morrison, judge of Claiborne County, Tennessee, has sold \$372,000 of Claiborne County road bonds to Mercantile Trust Co., of Jackson, Tenn., for par, at 5 per cent. Claiborne County will start work at once on her part of Dixie Highway, and will build complete system of five roads for that county, in addition to Dixie Highway.

Monroe, La.—See "Miscellaneous."

Groveland, Mass.—Sum of \$4,000 will be voted on to build section of oil gravel road from Haverhill city line in Bradford to junction of Salem and School Sts.

Lawrence, Mass.—By unanimous vote of city council Alderman Paul Hannagan, director of engineering, was authorized to do considerable paving this year.

Sheffield, Mass.—A special town meeting will be held to vote on proposition of raising money to aid in building of state road through town.

Dowagiac, Mich.—Action has been taken by Council for purchase of cement mixer for sidewalk work. Mayor and city clerk have been authorized to make such purchase at once.

Dowagiac, Mich.—Twenty-two new sidewalks will be built by city of Dowagiac this summer.

Grand Rapids, Mich.—The George W. Bunker Co. has contract for \$6,000 to cover with gravel and crushed stone San-Lu-Rae drive on south side of Reed's Lake.

Kalamazoo, Mich.—The \$113,000 worth of city bonds by recommendation of the bonding commission have been sold to Sidney & Spitzer Co., by City Council, at premium of \$8.60. But two other bids were received by the city, and both of these were below par. The bonds include \$46,000 for street improvements, \$24,000 for city improvements and \$25,000 for sewer extension. They will draw 4½ per cent.

Meridian, Miss.—City Council will hold meeting and among other things will be considered placing of curbs and gutters along paved streets that will connect with good roads. Additional streets and avenues will also be ordered paved.

Meridian, Miss.—Plans have been made for paving of various streets.

Meridian, Miss.—The \$50,000 good road bond issue for Beat 1, authorized at election, has been sold by Board of Supervisors to G. W. McNear, of Chicago, for premium of \$1.051.

Clatskanie, Mo.—City Council has accepted specifications as presented by the city engineer for paving of Third St. from west line of Washington St. to east line of Dickenson St.

Joplin, Mo.—Plans are under way for joint meeting of Joplin and Granby road advocates to be held in latter city either latter part of this week or first of next, to start movement to finish rock road between Granby and Diamond.

Walkerville, Mont.—Proposal to pave Main St. is before City Council.

Fremont, Neb.—Another paving district providing for pavement of Fifth St., between Bell and Pebble has been created by City Council.

Bridgeton, N. J.—New street sprinklers has been ordered purchased.

Newark, N. J.—Asphalt paving on large scale has been provided for by board of works. Bids will be asked at once for paving of Read St. and various other streets.

New Brunswick, N. J.—After carefully considering several bids submitted, the Board of Freeholders has decided not to award contracts for resurfacing of two county roads, one running from New Brunswick to Drury's Hill, South River, and the other being known as St. George's Ave., in Woodbridge Township. The bids received for resurfacing of the road known as Old Bridge Turnpike were as follows: Thomas H. Riddle, New Brunswick, \$34,673.78; Utility Construction Co., of New Brunswick, \$35,741.92; Northern Construction Co., of Newark, \$36,504.40; Thomas F. Dunigan, of Woodbridge, \$36,503.75. The bids were referred to the road committee. It is understood that about 4,500 tons of stone will be used in the improvements to this road. Proposals received on resurfacing of St. George's Ave. were as follows: Liddle & Pfeiffer, of Perth Amboy, \$65,386.82; M. Irving Demarest, of Sewaren, \$67,059.56; Thomas H. Riddle, of New Brunswick, \$72,014.87; Weldon Construction Co., of Rahway, \$68,446.92; Northern Construction Co., of Newark, \$82.87; Garafano Construction Co., of Summit, \$64,403.35; Thomas F. Dunigan, of Woodbridge, \$65,819.91. The bids were referred to the road committee. Five hundred tons of stone will be used.

Newton, N. J.—Town committee has decided to advertise for bids for paving with concrete of Spring St., from Lackawanna depot to Madison St. It is estimated that work will cost between \$6,000 and \$7,000, of which amount the state will pay \$2,000, the Lackawanna Railroad \$1,000 and the town the remainder.

Trenton, N. J.—Plans for a highway circuit, extending 320 miles across state and back, passing through 57 towns and cities, all to be lined with trees, have been considered at conference of Massachusetts Forestry Association at Worcester. A committee was appointed to make the surveys. Shorter circuits are planned for North Shore and South Shore, north and south of Boston.

Vineland, N. J.—The introduction of resolution fixing amount of bonds necessary to be issued for paving of Landis Ave. at \$100,000 was principal action by borough commission at weekly meeting.

Albany, N. Y.—Following are 3 lowest proposals received by State Highway Commission at its office No. 55 Lancaster St., Albany, N. Y., for the construction of following highways by state aid on Wednesday, the 16th day of June, 1915: Road No. 1239, Windsor Village-Main St., Broome Co., 0.68 mi.; The Lane Construction Co., Meriden, Conn., \$10,738.60; Joseph W. Heisler & Co., Schenectady, N. Y., \$10,919.40; Nash & Griffin, Norwich, N. Y., \$11,089. Road No. 1241, Chenango Forks-North Fenton, Broome Co., 2.32 mi.; Lane Construction Co., Meriden, Conn., \$20,750; F. P. Meckes, Long Pond, Pa., \$23,138; John H. Gordon, Albany, N. Y., \$23,742. Road No. 1273, Downsville Hamlet-Main St., Maple Ave. and Creamery Sts., Delaware Co., 2.50 mi.; Blankfield & Donovan, Kingston, N. Y., \$23,650.25; Ruddy-Saunders Cons. Co., Troy, N. Y., \$24,112.50; DeGraff & Hogeboom, Inc., Kingston, N. Y., \$24,168. Road No. 5554, Schoolhouse-Lasellsville, Pt. 1, Fulton Co., 4.58 mi.; C. W. Tryon, Boyntonville, N. Y., \$42,030; Clarence Welsh & Co., Gloversville, N. Y., \$42,507; Lane Construction Co., Meriden, Conn., \$43,369. Road No. 1098, Eagle Bay-Sixth Lake, Hamilton Co., 4.22 mi.; John J. Guinan Contracting Co., Brooklyn, N. Y., \$38,258; John F. Lewis, Albany, N. Y., \$38,473.50; John A. Jova, Inc., Newburgh, N. Y., \$40,892.01. Road No. 1100, Indian Lake-County Line, Hamilton Co., 4.54 mi.; Galloway & Co., New York City, \$43,720.50; J. D. Moynihan & Co., Inc., Mohawk, N. Y., \$44,575; Brady-Oltarsch Cons. Co., New York City, \$44,924.51. Road No. 5332-B, Lowville-Carthage, Lewis Co., 6.86 mi.; Spellman-Oliver Co., Chateaugay, N. Y., \$72,552.50; Fred E. Gross & Son, Yonkers, N. Y., \$73,572; Cattaraugus Eng. Co., Olean, N. Y., \$75,309. Road No. 1283, Rush-Henrietta, Monroe Co., 4.54 mi.; Cleveland & Sons Co., Brockport, N. Y., \$33,561; Chambers & Barnes, Rochester, N. Y., \$34,178; Whitmore-Rauber & Vicinius, Rochester, N. Y., \$34,299. Road No. 1284, Riga-Mumford, Monroe Co., 6.05 mi.; Fred E. Gross & Son, Yonkers, N. Y., \$35,274; Peter F. Connolly Co., Horseheads, N. Y., \$35,754; Cleveland & Sons, Brockport, N. Y., \$36,116.50. Road No. 5560, Middleport-Medina, Part 1, Niagara Co., 1.32 mi.; John W. Landel,

Tonawanda, N. Y., \$29,719; Dunkirk Cons. Co., Dunkirk, N. Y., \$29,970.50; McNerney Construction Co., Canton, Pa., \$30,578.50. Road No. 5561, Gasport-Middleport, Niagara Co., 4.42 mi.; Fred W. Knickenberg, Buffalo, N. Y., \$53,854.70; John W. Landel, Tonawanda, N. Y., \$54,618.50; Dunkirk Construction Co., Dunkirk, N. Y., \$55,040.50. Road No. 5562, Gasport-McNalls, Niagara Co., 2.33 mi.; McNerney Cons. Co., Canton, Pa., \$41,121.25; Fred W. Knickenberg, Buffalo, N. Y., \$41,838; John F. Dolan Contg. Co., New York City, \$43,617.95. Road No. 5563, Lockport-McNalls, Niagara Co., 5.07 mi.; Cattaraugus Engineering Co., Olean, N. Y., \$74,706.50; McNerney Construction Co., Canton, Pa., \$75,924.75; John Johnson Cons. Co., Buffalo, N. Y., \$76,041. Road No. 5559, Poland-Trenton, Oneida & Herkimer Cos., 8.89 mi.; C. W. Lyon, Boyntonville, N. Y., \$67,990; Fred E. Gross & Son, Yonkers, N. Y., \$68,834; Semper Brothers, Watertown, N. Y., \$69,393. Road No. 1072, Syracuse-Bridgeport, Part 2, Onondaga Co., 3.06 mi.; Phelan & Sullivan, Utica, N. Y., \$53,321.50; Frank S. & Anthony Sporato, Syracuse, N. Y., \$55,709; Antonio Mondo, Syracuse, N. Y., \$55,956.41. Road No. 1073, Minoa-Manlius, Center-Manlius, Onondaga Co., 7.23 mi.; Criswell-Mallory Co., Inc., Mechanicville, N. Y., \$85,388.65; Fred E. Gross & Son, Yonkers, N. Y., \$86,761.63; Chambers & Barnes, Rochester, N. Y., \$89,099.25. Road No. 1074, Eastwood Village-Burnet & Milder Aves., East Syracuse Village-West Manlius St., Onondaga Co., 1.91 mi.; John Davin, Syracuse, N. Y., \$40,977.63; Antonio Mondo, Syracuse, N. Y., \$42,145.76; William H. Ring Contg. Co., Ogdensburg, N. Y., \$43,245.02. Road No. 582, Holley-Ridge Rd., Orleans Co., 2.46 mi.; Brady-Oltarsch Cons. Co., New York City, \$20,122.76; Thomas Hucknall, Albion, N. Y., \$22,568.50; Greece Construction Co., Rochester, N. Y., \$23,171. Road No. 1293, Maple Ridge, Part 3, Orleans Co., 1.80 mi.; Goodrich & Truesdale, Barnard, N. Y., \$17,005.50; Rhoades & Clawson, Albion, N. Y., \$17,593.50; McNerney Construction Co., Canton, Pa., \$18,055. Road No. 1120, Troy City-Winter St., Rensselaer Co., 0.34 mi.; Martin Murray & Co., Troy, N. Y., \$15,055.10; Belmar Contg. Co., Inc., Troy, N. Y., \$15,290.85; Abner M. Harper, Inc., Newburgh, N. Y., \$15,395.35. Road No. 1154, Spring Ave.-Troy Poestenkill, Part 2, Rensselaer Co., 0.88 mi.; Gleason & Davitt, Albany, N. Y., \$7,976; Edward Rendert, Averill Park, N. Y., \$8,033.15; George Holler, Albany, N. Y., \$8,187.04.

Brooklyn, N. Y.—Construction of the boulevard across Jamaica Bay is being discussed.

Lyons, N. Y.—City council has adopted resolution providing for four blocks of pavement to be laid on streets around square. It was not decided definitely what materials will be used, but pavement probably will be built of brick on concrete foundation.

New York City, N. Y.—Following streets are to be paved with sheet asphalt: 38th St., from west side Park Ave. to east side Madison Ave.; West End Ave., south side of 91st St. to south side 96th St., and 95th St., west side Broadway to West End Ave.; 62d St., west side Columbus Ave. to east side Amsterdam Ave. Also following, with granite block: Amsterdam Ave., from north side of 63d St. to south side of 68th St., and 36th St., west side of 10th Ave. to east side of 11th Ave.

Niagara Falls, N. Y.—Pine Ave., from Third to Eighth Sts., will be repaved this summer, common council having instructed the works board to call for bids for the work.

Niagara Falls, N. Y.—Common Council has rescinded resolution adopted at the previous meeting not to pave Whitney Ave. from 11th to 18th Sts., and from 19th to 24th Sts., and recommended to works board that the street be paved from 11th to 22d Sts. City engineer estimated cost of improvement to be \$32,000, of which frontage property owners are to be assessed \$30,190 and \$1,010 is for intersections. Street is to be paved about 26 ft. wide.

Rensselaer, N. Y.—Board has declared its intention of paving following streets: Walker St., from Third to Second Ave.; Second St., from Catherine St. to McNaughton Ave.; Catherine St., from Third to Fourth St.; Riverside Ave., from Belmont Pl. to the Knickerbocker Ice Co. house; First St., from McNaughton to Washington Ave.

Schenectady, N. Y.—Ordinance has been adopted authorizing completion of pavement at public market, and later second ordinance authorizing bond issue of \$12,000 to pay for the same.

Syracuse, N. Y.—Board of contract and Supply has received proposals for number of local improvement contracts. Lowest bidders were as follows: Grading Amidon St., Clyde Ave. to Craddock St., H. C. Lewis, \$281.50; grading Schuler St., Winton St. to Teall Ave., C. Bonn, \$1,332; grading Herbert St., Winton St. to Teall Ave., C. Bonn, \$572.50; 12-in. sewer, Maryland Ave., Redfield Pl. to Euclid Ave., J. P. Piscose, \$222.70; 12-in. storm water and 8-in. sanitary sewer, Euclid Ave., Allen St. to Roosevelt Ave., A. Barr, \$568.53; 12-in. sewer, West Brighton Ave., from the present sewer to Clyde Ave., A. Barr, \$229.25; 12-in. sewer, Marguerite Ave., Sand St. to North Geddes St., C. Bonn, \$688; 12-in. sewer, Pine St., East Washington St. to East Fayette St., C. Bonn, \$353.25.

White Plains, N. Y.—Bids will be received on July 6 for paving of Lafayette St. from Fisher Ave. to Westmoreland Ave. Sidewalks, curbs and gutters will also be laid and relaid where necessary by property owners.

Bowling Green, O.—Resolution has been adopted declaring it necessary to improve North Grove St. between Clay St. and Evers Ave. in city of Bowling Green, O., by cement or macadam.

Celina, O.—Notice is hereby given that sealed bids will be received at county auditor's office in Celina, O., until Thursday, 8th day of July, 1915, at 1 o'clock p. m., for purchase of \$20,500 of Mercer County pike bonds for use and benefit of Gerlach Road Improvement. J. F. Steinbrunner is auditor.

Cincinnati, O.—Surveyor Boeh has reported that it will cost about \$14,000 to improve Beekley Rd., from Ramona to Allendale, and Board decided to inspect road. Board also decided to inspect Elm Ave., which it is proposed to improve from Terrace Park to Wooster pike at cost of \$1,835.

Cincinnati, O.—Surveyor Boeh has been directed to repair Batavia pike a distance of 8,450 yds. at cost not exceeding \$2,840.

Columbus, O.—Resolutions have been adopted for improvement of various streets.

Columbus, O.—Bids will be received at office of Board of County Commissioners of Franklin county, Columbus, O., until 10 o'clock a. m., standard time, on Friday, June 25, 1915, for purchase of bonds of said county aggregating sum of \$35,000, for purpose of providing funds for improvement of county road described as follows: Beginning at the intersection of Inter-county Highway No. 47 with east corporation line of city of Columbus; thence in easterly direction along route of I. C. H. No. 47 to its intersection with boundary line between Licking and Franklin counties.

Coshocton, O.—Paving bonds in sum of \$11,000 will be sold noon, July 10, 1915. Hugh Gamble is City Auditor.

Findlay, O.—City Council has passed ordinance to issue bonds in sum of \$9,000 to provide means to pay for pavement of Midland Ave. Ordinance was given three readings and passed under suspension of rules.

Mansfield, O.—Road repair and road improvement bonds in sum of \$31,746 will be sold until 2 p. m., July 15.

Niles, O.—Bids have been opened in office of the city auditor on two issues of bonds of the City of Niles. One of \$6,500 is to pay city's portion of cost of paving Lafayette, Erie and Mason Sts. and Heaton Ave. Other of \$14,000 is to pay city's share of cost of extension and improvement of Union Cemetery. It is understood Contractor De Jute is the lowest bidder on all the work. The extension and improvement of Union Cemetery will cost a total of \$21,000, of which the Township of Weathersfield will contribute \$7,000. Its bonds were sold some time ago.

Tiffin, O.—Bids will be received until noon, July 6, for purchase of bonds of said city in sum of \$64,000 for paving of West Davis, Wentz, Coe and East Market Sts. A. J. Hafley is City Aud.

Toledo, O.—Following ordinances have been passed: Ordinance to pave alley between Woodland Ave. and Dorr St., from Junction Ave. to Heston St.; ordinance to repave Adams St., from Summit St. to Ashland Ave.; ordinance to repave East Broadway, from Woodville St. to the tracks of the L. S. & M. S. Ry. Co.; ordinance to pave Garnet St., from Clarence Ave. to the southwesterly end of Garnet St.; ordinance to repave Jackson St., from St. Clair St. to 13th St.; ordinance to pave Richardson Drive, from Cherry St. to North Richardson Drive; ordinance to pave North Richardson Drive, from Richardson Drive to the boulevard.

Waldo, O.—Bids will be received at office of village treasurer of Waldo, Marion County, O., until 12 o'clock, noon, of Thursday, July 15, 1915, for purchase of 19 bonds of said village in aggregate sum of \$5,680 8-100 for improvement of Marion St., from north line of lots Nos. 136 and 137, to south corporation line of village of Waldo, by paving roadway of same with vitrified brick and constructing necessary sewer or drainage for said street.

Florence, Ore.—See "Water Supply."

Portland, Ore.—County Commissioners may award contracts in a few days for paving 70 miles of highway.

Oregon City, Ore.—Clackamas County's share of state automobile license fees, amounting to about \$1,600, will be used for oiling trunk roads leading from Multnomah to Marion County boundary.

Allentown, Pa.—Commissioners have determined to advertise for bids for stone for pike from Mickle's to Allentown, to complete work begun last year; for stone for Heckwelder Road, which runs from West Catasauqua to Mickle's Pike and 3d St., Fullerton. To cover cost of road work issue of \$20,000 in bonds is to be made.

Allentown, Pa.—A concrete road, from this city to Easton, to be a model highway, is proposition agreed to by State Highway Commissioner Cunningham and party of prominent local men and work will be begun at once on its construction. Road is to be built from Allentown line city limits to Bethlehem city limits and thence from Bethlehem through Butztown and Farmersville. It is to be of solid concrete and in its construction successful experiments with concrete roads in suburbs of Detroit will be followed out.

Berlin, Pa.—Special election on bond issue of \$8,000 will be held here on June 29. Money will be used for reconstructing and improving Main St., from East End to western borough limits.

Connellsville, Pa.—A resolution has been adopted deciding that all streets paved in future should be on foundation of crushed stone. Hitherto coke ashes have been used as base and streets have not been standing up as they should.

Harrisburg, Pa.—Cement industries of Eastern Pennsylvania and citizens in Lehigh and Northampton counties have entered into agreement with state highway department to furnish sufficient cement to build road 12 miles in length, running from borough line of Allentown to Easton. According to estimates of state highway department this will require upwards of 40,000 barrels of cement.

Johnstown, Pa.—Extension of Rose St. is being petitioned for.

Lebanon, Pa.—Bids will be received by Mayor and Council until 5 p. m., July 1, for about 4,000 sq. yds. street paving on 8th St. Also separate bids for paving 9th St., about 12,400 sq. yds. pavement, and separate bid on Lehman St., about 8,300 sq. yds. pavement. T. R. Crowell is City Engineer and D. M. Sharp is City Clerk.

Merion, Pa.—Lower Merion Township Commissioners have passed an ordinance authorizing issuance of \$20,000 bonds for work on highways in township. Ordinances for opening of Wister and Edgewood Rds., in Ardmore, and three roads on the Townsend estate in Overbrook were also passed.

Pittsburgh, Pa.—Penn. Ave. improvement bonds in sum of \$20,000 have been sold to Gordon & Co.

Pittsburgh, Pa.—The Union Trust Co., of Pittsburgh, was highest bidder for \$90,000 issue of Hamilton Ave. improvement, 30-year, 4½ per cent. bonds.

Williamsport, Pa.—Councilman Minor has offered ordinance providing for paving of Arch St., between Philadelphia & Reading Railroad and Water St. Appropriation was \$4,100. Ordinance passed first reading unanimously.

Williamsport, Pa.—The ordinance providing for widening and grading of Long Reach Rd. for distance of 2,830 ft., making highway approximately 33 ft. in width, has passed second reading. Appropriation for work is \$1,000.

Williamsport, Pa.—Improvement of Market St. is being planned.

Florence, S. C.—Election will be held June 30 for voting on building additional bitulthic roadways and ten miles of concrete sidewalks.

Columbia, Tenn.—Under terms of ordinance passed by board of mayor and aldermen of Spring Hill on June 11, election will be held in that town on Saturday, June 26, for purpose of determining whether or not interest bear-

ing bonds in the sum of \$6,000 will be issued for street improvement.

Beaumont, Tex.—To discuss proposition of paving Magnolia Ave. from Long Ave., north, to Magnolia Park, a distance of 18 blocks, property owners on that street will hold mass meeting.

Dallas, Tex.—Paving of Bishop Ave. and Commerce St. are being planned. Estimated cost, \$150,000.

Dallas, Tex.—Considerable proposed street work has been ordered by board of city commissioners upon recommendation of Commissioner Otto H. Lang. Contemplated improvements provide for widening of Live Oak St., from Pacific to Germania; paving of Bullington its entire length, and Federal from Harwood to Masten, and the opening of a new street between Duncan and Merlin.

El Paso, Tex.—El Paso County needs bond issue of not less than \$750,000, if not \$1,000,000, for repair of present roads and building of new roads in the county.

Seymour, Tex.—Election held to decide on construction of sidewalks resulted in favor of same by vote of two to one. Property owners will pay for the improvement.

Spurger, Tex.—At meeting at Spurger, Tyler County, Tex., petitions were prepared and will be presented to County Commissioners' Court in August, asking that election be ordered on issuance of \$100,000 bonds for public highway improvement.

Texarkana, Tex.—City Engineer Baum, of East Side, has been retained by state highway engineer to make survey of proposed highway between Camden and Stephens, Ark., and, it is stated, work of the survey is to start at once. It is understood this road is to be made one of best in entire state.

Bristol, Va.—Ordnance is being considered to set aside four streets in Fairmount district for construction of concrete pavements. It is planned to build Taylor St., from Pennsylvania Ave. to Maryland Ave.; Maryland Ave., from Taylor St. to Cypress St.; Spruce St., from Florida Ave. to Virginia Ave., and Georgia Ave., from Poplar St. to Maple St. There will be 18,050 sq. yds. in district, and work is estimated to cost \$25,000. All streets will be built 24 ft. with parking on either side.

Norfolk, Va.—Following are items approved by unanimous vote of committees: Clay Ave., from Brambleton to Highland Ave., sheet asphalt paving and curbing, \$5,444; Yaxley's lane, from Main to Water St., granite block paving, \$2,012.50; 19th St., from Granby St., west as far as appropriation will provide, sheet asphalt paving, sewer and water installation, \$7,000; Chapel St., from Princess Anne Ave. northward, as far as appropriation will provide, paving with No. 2 granite block, curbing and gutter, sewer and water installations, \$8,000; Bowden's Ferry Road, from 20th St. northward as far the appropriation will provide, combined curb and gutter, sewer and water installations, \$7,000; 46th St., in front of armory of the Norfolk Light Artillery Blues, valley gutters on the sides adjacent to the armory, and curb and gutter on opposite side, grading, etc., \$250.

Moundsville, W. Va.—At special session of Marshall County Court at Moundsville, bids were opened for macadamizing of Fairmont-Wheeling pike in this district out of \$50,000 of funds appropriated for this purpose.

Wheeling, W. Va.—Matter of purchasing street flusher has been brought up, but held over until next meeting night.

Wheeling, W. Va.—Council has passed resolution providing for paving of Fifth St., between Grant and Jefferson Aves., with concrete foundation.

Tacoma, Wash.—Of particular interest in city improvement work this month will be letting of contract for installation of about 3½ miles of cement sidewalks in the North End, at an estimated cost of \$12,000. This work is to replace old wooden walks which have become dangerous to pedestrians. The new walks will be on Stevens, Mason and Verde Sts. and on North 37th, 38th, 39th, 41st, 42d, 43d, 44th, 45th and 46th Sts. Bids will be taken shortly on the contract.

Two Rivers, Wis.—Following bids have been received for street improvements: (a) Murphy Const. Co. (b) Walter O. Bahr. (c) E. J. H. Thiede; 18,890 sq. yds. plain macadam per sq. yd. (a) 70c., (b) 83c., (c) 68c.; 4031 sq. yds. asphalt macadam per sq. yd. (a) 97c., (b) \$1, (c) 94c.; 11,913 lin. ft. con-

crete curb and gutter per lin. ft. (a) 39c., (b) 42½c., (c) 42c.; 1,974 lin. ft. gutter only per lin. ft. (a) 25c., (b) 29c., (c) 24c. Totals (a) \$22,272.64; (b) \$25,345.19 and (c) \$22,111.56. E. M. De Bruin is chief engineer.

Superior, Wis.—City commission has formally selected reinforced concrete as material with which to improve John Ave. at South End.

Niagara Falls, Ont., Can.—Fort Erie property owners will vote on by-law to spend \$10,000 on road improvements. This amount includes funds to pave from ferry landing to Main St. It is understood that village will accept proposition of park commission to extend boulevard to Fort Erie on basis of 35 per cent of cost to village.

CONTRACTS AWARDED.

Gridley, Cal.—City Trustees have awarded contract for paving 15 blocks of local streets to Clark & Henery, whose bid was \$52,373.40. Contract calls for pavement with 4-in. concrete base. Cost will be 18.2 cts. per sq. ft.

San Francisco, Cal.—Board has given the contract for constructing artificial stone sidewalks in front of Golden Gate Park on Fulton St., from 14th Ave. to Great Highway, to J. F. Dowling at rate of 9 cts. per sq. ft., amounting to \$5,373. Contract for curbing and paving east side of 14th Ave., between Anza and Fulton Sts., has been awarded to Owen McHugh for \$7,896. The City Street Improvement Co. has taken contract to pave and sewer San Bruno Ave., between Vista and Bay Shore Ave., for \$29,895, the total cost, including inspection, being estimated at \$35,000. Eaton & Smith have obtained contract to pave Wisconsin St., between 20th and 22d, their bid amounting to \$13,333.

Fort Collins, Colo.—To F. C. Dreher Contracting Co.'s contract for 3 miles of road in National Park, Fall River Canyon. Contract calls for 9,000 cu. yds. solid rock excavation, 9,000 cu. yds. loose rock excavation, 2,000 cu. yds. earth excavation. Office is located 1575 Lafayette St., Denver.

Fort Collins, Col.—Contract has been awarded to Monroe & Sons for placing gravel surface on north and south state highway between Berthoud and Loveland.

Washington, D. C.—For paving streets with asphalt to Warner-Quinlan Co., Syracuse, N. Y., at \$1.49 per sq. yd., or total about \$100,000. Montezuma brand was specified.

Macon, Ga.—Paving contracts have been awarded as follows: Concrete paving with concrete base to C. M. Preston Co., Macon, Ga., at \$1.17 per sq. yd., and to same firm for resurfacing with shale brick paving at \$1.24 per sq. yd., and to Massee & Co., Macon, Ga., for asphalt paving on concrete base at \$1.35 per sq. yd. D. S. Jones is City Clerk.

Fort Wayne, Ind.—Park Commissioners will award to John E. Grosjean contract for constructing sidewalks on Rudisill Blvd., between Fairfield and Broadway, on his bid of \$5,682.38. Next best bid was submitted by Moellering Construction Co., at \$5,787.89.

Fort Wayne, Ind.—Following contracts have been awarded: Ruth St., 719 yds., preliminary order for concrete confirmed, contract awarded to the C. E. Moellering Construction Co.; State St., 21,435 yds., preliminary order for brick changed by petition to asphalt, contract awarded to the Grace Construction Co.; Begue St., 1,901 yds., preliminary order for concrete changed by petition to bituminous concrete, and contract awarded to the Grace Construction Co.; Murray St., 3,458 yds., preliminary order for brick confirmed and contract awarded to the C. E. Moellering Co.; Hoagland Ave., 5,737 yds., the preliminary order for asphalt confirmed and contract awarded to the Grace Construction Co.; Beaver Ave., 827 yds., preliminary order for concrete, and Rockhill St., 1,562 yds., and Jones St., 818 yds., preliminary orders for brick, confirmed, and the three contracts awarded to the C. E. Moellering Construction Co. Totals—Grace Construction Co., 29,073 yds.; Moellering Construction Co., 7,384 yds.

Indianapolis, Ind.—Board of county commissioners have awarded to McKinsey & Jenkins contract for building improved road on boundary line between Franklin and Perry Township. Low bid of \$14,957 was submitted by McKinsey & Jenkins. Road will be about a mile in length.

Jackson, Ind.—For construction of gravel road to Wm. E. Allen, Hillsboro, Ind., at \$3,830.

Laporte, Ind.—For construction of gravel road to Geo. M. Gross.

Laporte, Ind.—George M. Gross, of this city, has been awarded the contract for construction of street curb and gutter work at Valparaiso. The total number of feet is over 7,000.

Valparaiso, Ind.—City council has awarded contract for 7,190 ft. of concrete curbing and gutter to George M. Gross, of Laporte.

Atlantic, Ia.—For construction of 25,000 sq. yds. concrete pavement to P. C. Hansen & Son, Sioux City, at \$1.14 per sq. yd. paving and 40 cts. per cu. yd. excavation. Total bid, \$35,000.

Iowa City, Ia.—William J. Barry is lowest bidder in contract for cement sidewalks in this city.

Arkansas City, Kan.—To Chas. Bessler Construction Co., Winfield, Kan., contract for 12,000 sq. yds. 3-in. vertical fiber brick paving on 4-in. concrete base, 1½-in. sand cushion, Texaco asphalt filler at \$1.81 per sq. yd. S. K. Titus is city engineer.

Lexington, Ky.—To Carey-Reed Co., for improvement of South Broadway, at following bid: Asphalt pavement, type C, \$1 per sq. yd.; headerstone, 50 cts. per lin. ft.; concrete, \$5.10 per cu. yd.; combined cement curb and gutter, 60 cts. per lin. ft.; cement gutters, \$1.50 per sq. yd.; cement sidewalks, 15 cts. per sq. ft.; resetting old curb, 15 cts. per lin. ft.; cement curb with steel protection radii, \$1 per lin. ft.; resetting manhole tops, \$2.50 each; manholes, new, \$30 each; resetting old catch basins, \$2.50 each; catch basins, new, \$40 each; 5-in. pipe, 50 cts. per lin. ft.; 10-in. pipe, 80 cts. per lin. ft.; 12-in. pipe, 90 cts. per lin. ft.; 15-in. pipe, \$1 per lin. ft.; 18-in. pipe, \$1.25 per lin. ft.; asphalt concrete in street railway tracks, \$1 per sq. yd.; concrete in street railway tracks, \$5.10 per cu. yd.

Mayville, Ky.—To Rue & Schmidt Co., 8th and Madison Sts., Covington, for \$90,000 contract for paving 3,500 lin. ft. of 36-ft. street with brick on 6-in. concrete base; concrete at \$4.50 per cu. yd., brick at \$1.25 per sq. yd., and grading at 40c. per cu. yd. W. L. Glazier is engineer, Newport, Ky.

Newport, Ky.—Bids for reconstruction of Hamlet St., south of 10th St., have been opened and contract awarded to E. J. Knepple at his bid of \$1,233.50. Same contractor was awarded contract for reconstruction of St. Johns Alley at his bid of \$579.

Sault Ste Marie, Mich.—Contract for construction of proposed bitulithic pavement on Portage Ave., between Bingham Ave. and water power canal bridge, will be formally let to Trinidad Paving Co. of Cleveland by Board of Public Works. Recommendation of board that this firm be given contract at price less than estimated cost by city engineer, which is \$36,100, was approved by Common Council and board authorized to enter into formal agreement.

Duluth, Minn.—Contract for paving of Fifth alley from 24th to 25th Ave. east will be awarded to A. N. Nelson on his bid of \$1,525.70. The alley will be paved with one-course concrete.

Duluth, Minn.—Ordinances and resolutions awarding contracts and calling for appropriations and expenditures amounting to more than \$100,000 came up for consideration at regular Council meeting. A resolution awarding contract for paving of Commonwealth Ave. from Crestline court to south line of Gary, to Rogers & McLean on their bid of \$38,728 for class A brick was introduced by Commissioner Farrell. Measure will come up for a final vote at next meeting. Contract for paving of First St., from 28th Ave. east to Congdon Park, over which there has been a controversy during last two weeks because of objections made by Patrick McDonnell, contractor, was awarded to the General Contracting Co., of Minneapolis, on its bid of \$24,985.67. The thoroughfare will be paved with bitulithic. Commissioner Farrell introduced a resolution awarding contract for paving of Sixth St., from 15th to 18th Aves., east, and 16th Ave. east, from Sixth to Eighth Sts., to August Bodin & Son, on their bid of \$20,423.10 for asphalt and bituminous concrete. Final action on measure will be taken next meeting when contract for paving of Exeter St., from Pacific Ave. to Grand Forks Ave., and extension of Exeter St. to Third St., with one-course concrete pavement, will also

be awarded to Olson & Johnson on their bid of \$12,222.55.

St. James, Minn.—To Joe Gompson, Mankato, at 16c. per cu. yd. for turning, and Andrew Peterson, Tyler, for culverts, for improving 22½ miles of road.

Weston, Mo.—For construction of 10,000 sq. yds. bituminous macadam to Mid West Const. Co., Kansas City, Mo., at 87 cts. per sq. yd. for resurfacing and \$1.13½ per sq. yd. for new work. About 1,000 ft. of concrete gutter and curb was also let, and about 2,000 yds. ditch fill. T. Riley is City Clerk.

Anaconda, Mont.—For paving with asphaltic concrete on rock base Park Ave. and Main St., to Clifton & Applegate at \$27.609.

Concord, N. H.—Representative Jas. J. Gannon has been awarded contract to lay gutter curbing around State House walks, by board of public works. His bid of 50 cts. per lin. ft. was lowest. There are approximately 1,500 ft.

Concord, N. H.—For 4,470 sq. yds. granolithic sidewalks to Simpson Bros., 166 Devonshire St., Boston, Mass., at total of \$1,939, and for 970 lin. ft. granite curb to Thomas Fox, Concord, N. H., at \$3,295.

Camden, N. J.—To Lambertville Quarry Co., Philadelphia, Pa., and Birdsboro Stone Co., Birdsboro, Pa., for furnishing 1½-in. and ¾-in. broken trap rock.

Clifton, N. J.—Bids have been opened for curbing, grading and flagging of Hope Ave., between Center St. and Highland Ave. The Union Building & Construction Co., of Passaic, was awarded contract, being lowest bidder, at \$1,482. Bids were also opened for curbing, grading, flagging of William St., Shire & Wood, of Rutherford, bidding \$1,352, received the contract.

East Orange, N. J.—For construction of 3,200 sq. ft. sidewalks, following bids were received: C. S. Carranino, 192 Hawthorne Ave., Newark, N. J., 14 cts. per ft.; Peltro Fagio, Silver Lake, N. J., 14 cts. per ft.; Thos. G. Schriver, East Orange, N. J., 15 cts. per ft., and Frank Griceo, East Orange, N. J., 16 cts. per ft.

Jersey City, N. J.—For paving by City Comrs. as follows: Grove St. to Van Keuren Contr. Co., and Clerk St. to Shreffler-Burns Co.

Newark, N. J.—For asphalt paving of three streets, Richard St., 3,300 yds., Oraton St., 3,000 yds., and Clifton St., 6,600 yds., to Continental Public Works Co., 2 Rector St., New York, at \$1.64 per sq. yd., and for wood block repaving of Ferry St., 8,900 sq. yds., to Glenfield Construction Co., Newark, N. J., at \$2.84 per sq. yd.

Newark, N. J.—The low bid for paving of Springfield Ave., Millburn, with type known as Roman Road, received by road committee of board of freeholders, was six cents a sq. yd. cheaper than low bid received in October, when work was first advertised. The Franklin Contracting Co., of New York, which was low bidder in October at \$1.60 a sq. yd., again was low, offering to do work for \$1.54 a sq. yd. Committee recommended that contract be awarded to this concern.

Newark, N. J.—Lowest bid received for county of Essex for 8,800 sq. yds. Roman Rd. pavement was that of Franklin Cont. Co., 52 Vanderbilt Ave., New York City, at \$1.54 per sq. yd.

New Brunswick, N. J.—Marcus Wright of South River, was awarded the contract for the erection of a concrete culvert over Prentiss Brook, in Jeffries St., South River, with an estimate of \$650.

Passaic, N. J.—Contract for repairing Bloomfield Ave., Prospect St. and Home Ave. will probably be awarded to Geo. F. Brackett at \$1.49 per sq. yd.

Brooklyn, N. Y.—Following is lowest bid opened June 9 by L. H. Pounds, Boro. Pres., for paving: Regulating and repaving with granite on 6-in. concrete foundation Wythe Ave. from S. 8th St. to N. 11th St.; Clancy & Nuhn Contr. Co., 31 Hunterspoint Ave., Long Island City, \$58,258. Unit prices of lowest bidder: 1,500 lin. ft. old curb reset in concrete, 80 cts.; 7,150 lin. ft. new curb set in concrete, 80 cts.; 200 lin. ft. granite heading stones set in concrete, 80 cts.; 2,795 cu. yds. concrete, outside railroad area, 1 ct.; 25 cu. yds. concrete, within railroad area, 1 ct.; 16,915 sq. yds. grade 1 granite pavt., with joint fill of coal tar, pitch and sand, \$3; 140 sq. yds. adjacent pavt. relaid, 50 cts.; 1 park basin head, furnished and set, \$35; 25 new covers and heads four sewer manholes, \$12; repaving with permanent iron slag pavt. on 6-in. concrete East, Market Aves., West and other streets: Jos. J. E.

Lamarsh, 360 Ovington Ave., Brooklyn, \$45,952. Unit prices of lowest bidder: 785 lin. ft. old curb reset in concrete, 1 ct.; 4,030 lin. ft. new curb set in concrete, \$1; 295 lin. ft. bluestone heading stones set in concrete, \$1.25; 2,120 cu. yds. concrete, \$4.50; 12,700 sq. yds. iron slag pavt., with joint fill of cement grout, \$2.50; 200 sq. yds. adjacent pavt., relaid, \$1; 5 new covers and heads for sewer manholes, \$11. Repaving with permanent asphalt on 6-in. concrete Fulton St. from Reid Ave. to Williams Pl.: Brooklyn Alcatraz Asphalt Co., 407 Hamilton Ave., Brooklyn, \$44,070. Unit prices of lowest bidder: 1,510 lin. ft. old curb reset in concrete, 60 cts.; 11,070 lin. ft. new curb set in concrete, 95 cts.; 200 lin. ft. bluestone heading stones set in concrete, 75 cts.; 75 lin. ft. granite heading stones set in concrete, 90 cts.; 3,890 cu. yds. concrete, outside railroad area, \$3.60; 23,360 sq. yds. asphalt pavt., 75 cts.; 40 sq. yds. adjacent pavt. relaid, 40 cts.; 2 sewer basins rebuilt, \$75; 74 noiseless covers and heads for sewer manholes, \$10.

Brooklyn, N. Y.—Following are lowest bids opened on June 9 by L. H. Pounds, Boro. Pres., for paving as follows: Regulating and repaving with granite on 6-in. concrete foundation 2d Ave. from 43d St. to 52d St. Lowest bidder, Ulrich & Co., 939 Lafayette Ave., Brooklyn, as follows: 600 lin. ft. old curb reset in concrete, 50 cts.; 850 lin. ft. new curb set in concrete, 85 cts.; 250 lin. ft. granite heading stones set in concrete, \$1; 1,260 cu. yds. concrete, outside railroad area, \$4.25; 175 cu. yds. concrete, within railroad area, \$2.45; 7,535 sq. yds. grade 1 granite pavt., with joint fill of coal tar pitch and sand, \$2.45; 145 sq. yds. adjacent pavt., relaid, \$1; 2 new sewer manhole covers, \$10; 1 new cover and head for sewer manhole, \$10; total, \$25,361. Repaving with asphalt on 6-in. concrete foundation Gates Ave. from Franklin Ave. to Reid Ave. Lowest bidder, Sicilian Asphalt Paving Co., 41 Park Pl., New York, as follows: 190 lin. ft. old curb reset in concrete, 60 cts.; 110 lin. ft. new curb set in concrete, 93 cts.; 2,530 cu. yds. concrete, outside railroad area, \$5.15; 15,405 sq. yds. asphalt pavt., outside railroad area, 75 cts.; 5 sq. yds. adjacent pavt., relaid, \$2; 1 new iron basin head, \$50; total, \$25,379. Repaving with Grade 1 granite on 6-in. concrete Washington St., from Front St. to Tillary St. Lowest bidder, Ulrich & Co., 939 Lafayette Ave., as follows: 190 lin. ft. old curb reset in concrete, 50 cts.; 2,580 lin. ft. new curb set in concrete, 87 cts.; 120 lin. ft. granite heading stones set in concrete, \$1; 1,040 cu. yds. concrete, \$4; 6,240 sq. yds. grade 1 granite pavt., with joint fill of coal tar pitch and sand, \$2.48; 65 sq. yds. adjacent pavt., relaid, 50 cts.; 4 new covers and heads for sewer manholes, \$12; total, \$22,175.

Dunkirk, N. Y.—Four bids have been submitted for building of approximately 6,200 sq. ft. of concrete sidewalk at Fourth Ward school building. James McNamara was low bidder and was awarded contract. His bid was 8½ cts. per sq. ft.

East Syracuse, N. Y.—At meeting of village board George A. Whitehead and Frank Kellar, both East Syracuse contractors, were only bidders for construction of 1,850 ft. of curbing in McCool Ave., to be built by village. Former was lowest bidder, with 45 cts. per lin. ft., while latter bid was 1 cent higher. Whitehead was awarded the work.

Little Falls, N. Y.—For paving E. Monroe St. to Warren Bros. Co., Boston, Mass., at \$22,959.

Victor, N. Y.—For paving Main and Cedar Sts., to Schroeder-Hicks Contr. Co., Rochester, at about \$23,272.

Columbus, O.—Contracts for paving Parkview and Drexel Aves. in Bexley have been awarded by village council to Trinidad Paving Co., of Cleveland. Warren Brothers bitulithic pavement was specified. The Parkview Ave. contract is for \$60,000. It is second street east of Alum Creek, and extends from Broad St. north past the R. H. Jeffrey home. It will be paved throughout its length. Contract for Drexel Ave. is for \$13,000. It is third street east of Alum Creek and extends between Broad and Main Sts.

Cleveland, O.—For construction of concrete culvert over Doan Brook in Rockefeller Park to C. A. White Co. at \$15,300.

Cleveland, O.—For grading, draining and paving W. 76th St. to Bentley Bros. at \$1,158.50.

Mt. Victory, O.—For 6,500 sq. yds. brick paving to Brewer, Tomlinson &

Brewer, Chillicothe, at \$14,300. Engineers are Smith & Boulay Co., Nasby Bldg., Toledo.

Niles, O.—Contracts for paving Heaton Ave. and Wood, Lafayette and Erie Sts., bids on which were received last week, will be awarded to Contractor James DeJute.

Rocky River, O.—For construction of 9,600 sq. yds. tar madacum on concrete foundation and 3,000 cu. yds. excavation to Cleveland Trinidad Paving Co., Cleveland, O., at 99 cts. per sq. yd. for paving; 63 cts. per cu. yd. concrete base and 40 cts. per cu. yd. excavation, total bid \$22,302.

Youngstown, O.—City Board of Control has let contract to R. C. Shook, of this city, for grading and bridge foundations on Fredericksburg road at Milton reservoir. Shook's bid of \$36,284.50 was lowest submitted.

Albany, Ore.—Contracts have been let by city council for paving of several additional blocks of streets to Asphalt Machinery Co., of Seattle, for asphaltic pavement at \$1.05 per sq. yd., with a 10-year guarantee.

Allentown, Pa.—By township of Whitehall, Lehigh Co., for 4,000 sq. yds. one course concrete to A. R. Hawk, Northampton, Pa., at \$1.29 per sq. yd.

Altoona, Pa.—To Bell-Rockel Co. for paving with brick of 15th Ave., 18th to 19th Sts., and N. 9th Alley, Union Ave. to 23d St., for \$2.17 and \$2.19 per sq. yd. respectively.

Connellsville, Pa.—Street paving contracts involving an expenditure of approximately \$16,900 have been awarded by Council. More contracts are expected to be let at the regular meeting for June. The following contracts were awarded last night: Isabella Rd., Bernard O'Connor, Connellsville, \$11,753.67. Murphy Ave., between Cottage Ave. and a point opposite the east boundary of the Cottage State Hospital, representing about one-third of the street, Brooks & Cornish, Uniontown, \$3,131.23 (approximate). Cottage Ave., between Fayette St. and Murphy Ave., to Brooks & Cornish, Uniontown, \$3,038.68. All streets are to be paved with Soisson fire brick on crushed stone foundation.

Connellsville, Pa.—The bid of Soisson Brick Co., Bolivar, Pa., to furnish No. 1 paving block at \$17 a thousand has been accepted and an initial order of 290,000 placed.

Connellsville, Pa.—South Pittsburg St. from end of present paving to city line has been awarded to Brooks & Cornish of Uniontown for \$15,206.56. North Pittsburg St., from end of present paving to city line has been awarded to Duggan & Miller for \$5,614. Morrell Ave., from end of present paving to King St., has been awarded to J. I. Dick, Scottdale. The total cost of paving this street is \$13,818.26, and to King St. represents approximately half. All of streets contracted for are to be of brick on crushed stone base. Another order of \$470,000 Soisson brick was placed. All of \$90,000 worth of paving will be done this summer. This means 12 streets.

Hazleton, Pa.—For paving Alter St. with Toronto brick to John Leffler at \$17,171.60.

Johnstown, Pa.—M. M. Sheesley & Sons have been awarded contract for grading and paving Fairfield Ave. on either side of new subway, placing sanitary and storm sewers, and building concrete retaining walls, at special meeting of council this morning. Contract price was \$7,987.17. Competition for the job was keen. Following were the other bids: James & Fulton, \$8,872.81; Thiele Construction Co., \$9,450.93; Berkebile Bros., \$9,008.44; Ressler & Robertson, \$9,470.25; Baker-Owen Construction Co., \$10,346.60; Charles Schenkemeyer & Sons, \$9,627.06.

New Castle, Pa.—Two rather important contracts have been let by Council to Charles Staph, the well known local contractor. The Smithfield St. and Phillips Pl. paving jobs were awarded to this contractor, his bids being lowest in both cases. Bids were submitted as follows: Smithfield St. paving: Charles Staph, \$10,431.05; Burns Brothers, \$10,494.25; M. E. Miller, \$11,012.45; Woods & Golder, \$10,646; M. J. Scanlon, \$11,145.55; Phillips Pl. paving: Charles Staph, \$15,446.90; Woods & Golder, \$2,082.15.

Philadelphia, Pa.—Bids have been received for improvement of Northeast Boulevard, from Rhawn St. northward, including the branches. Three bids were received for this work, names of bidders and total amounts being as follows: McNichol Paving & Construction Co., 1923 Cherry St., \$285,546.35; Bower & Ruch, Wayne & Roberts Aves., \$303,-

273.36; James McGraw Co., 1010 Commercial Trust Building, \$397,219.53. Following are unit prices bid by low bidder on principal items: Earth grading, 28c. per cu. yd.; bituminous pavement, 53½c. per sq. yd.; concrete base, \$4.43 per cu. yd.; vitrified block pavement, \$1.46 per sq. yd.; concrete curb, 54c. per lin. ft.; concrete footways, \$1.36 per sq. yd., and topsoil, 25c. per sq. yd.

Philadelphia, Pa.—Among the contracts awarded for highway bureau supplies are following: 500,000 paving blocks, the McAvoy Vitrified Brick Co., \$19.70 a thousand; 300 tons torpeda granite, Frank B. Johnson, \$2.14 a ton, and 20 carloads broken stone, George A. Simms, \$1.24 a ton.

Pittsburgh, Pa.—By County Commissioners for furnishing 15,000 tons of asphalt mixture to Booth & Flinn Co., Ltd.

Pittsburgh, Pa.—Contracts for improvement of five separate highways, representing expenditure of approximately \$110,000 have been awarded by county commissioners. Figures of successful bidders were lower than it was estimated the work would cost. There were 74 bids submitted. Contract for Jack's Run Road, 1.6 miles, in Ross Township, to be built of macadam, was let to Collins Gordon Contracting Company for \$28,968.55; the Thompson and Wible Run connecting road, 2.4 miles, in Shaler Township, of macadam, to John Foley Contracting Co., of Columbus, O., for \$34,815.30; the Oakwood Road, .44 miles, in Chartiers Township, of brick, to Matthew Ott & Co., \$9,990.20; the Middletown Road, 1.25 miles, in Chartiers Township, of brick, to Mathew Ott & Co., \$31,013.51; the Bower Hill Road, ¼ mile, in Collier Township, of macadam, to the Collins Gordon Contracting Co., \$4,368.50.

Yankton, S. D.—For construction of one block of concrete sidewalks, to Mike Walsh, Yankton, S. D., at 1½ cts. per ft.

Steubenville, W. Va.—A. W. McDonald has been awarded Irondale pike work at estimated cost of \$50,000, of which county will pay 35 per cent. Section No. 1 will have Tarvia binder; No. 2, part same as No. 1 and part slag wearing course; Section 3, same as No. 2; Section 4, same as No. 1; Section No. 5, macadam.

Colfax, Wash.—To W. G. Milligan Co., Spokane, at \$7,655, for dirt and rock work, grading about 3½ miles of Andy Horton highway.

Seattle, Wash.—Contract for big 10th Ave. paving job has been awarded to F. McLellan & Co., on bid of \$204,687.01. The contract for paving Eighth Ave. West was awarded to Jahn Contracting Co. on bid of \$29,530.71 for sandstone paving. Following bids were received on latter job at special meeting: Coluccio & Bressi, \$30,048.50; \$30,048.50; Argentieri & Co., \$30,981.24; \$31,043.99; T. Ryan, \$31,352.05; \$31,352.05; Ind. Asphalt Paving Co., \$29,830.70; \$29,705.20; Jahn Con. Co., \$29,530.71; \$29,530.71; P. J. McHugh, \$30,057.91; \$30,057.91.

Washington.—Following is lowest bid opened June 1 by State Highway Comm. at Olympia for work on Pacific Highway from Toledo South: Andrew & Harter, Portland, Ore., \$19,585. Unit prices of Andrew & Harter, successful bidders: 38,160 cu. yds. excav., inc. haul of 400 ft., 26 cts.; 22,800 cu. yds. overhaul on above material, per ea. 100 ft., 2 cts.; 21.1 acres clearing, \$80; 28.2 acres grubbing, \$140; 25 cu. yds. riprap hand placed, \$4; 9 cu. yds. concrete, 1st class, \$16.50; 54 cu. yds. concrete, 2d class, \$15.50; 1,280 lbs. steel reinforcing bars in place, 5 cts.; 9 M ft. timber and plank, incl. spikes and bolts, \$28; 594 lin. ft. plain concrete pipe in place, 12-in. diam., \$1.25; 246 lin. ft. plain concrete pipe in place, 18-in. diam., \$2.75; 68 lin. ft. plain concrete pipe in place, 24-in. diam., \$4.25; 84 lin. ft. plain concrete pipe in place, 36-in. diam., \$5.50.

Racine, Wis.—For 1,260 sq. vds. brick and cedar block on concrete foundation to Jas. Cape & Sons Co., Racine, Wis., at \$2.12 per sq. yd. for paving and 59 cts. for curb and gutter. Total bid, \$3,036.41.

Sheboygan, Wis.—For furnishing 10,000 gallons of road oil to Standard Asphalt Road Oil Co. No. 5 at 3.34 cts. per gallon.

SEWERAGE

Washington, D. C.—An American consular officer in Chile has reported that business man in his district desires to secure catalogues and prices of forms and machinery for making small concrete sewer pipe. No. 17,275, Bureau of Manufactures.

Daytona, Fla.—At special meeting of city council, council voted to accept offers for city's sewerage bonds. The two ordinances authorizing board of public works to sell \$150,000 of Daytona sewerage and drainage bonds passed on third and final readings. One of ordinances grants disposal of \$100,000 bonds to Bryant & Co., of Jacksonville, at 96c. on the dollar, and remaining \$50,000 to Merchants Bank of Daytona, at 94c. on the dollar.

Ottawa, Ill.—One bid has been received by board of local improvements for construction of Madison St. sewer from Public Service Construction Co., of Omaha, Neb. The bid conforms with estimate of City Engineer Farnsworth, which is \$4,833.60. The bid was placed on file according to law.

Waukegan, Ill.—Sanitary sewer will be laid on Liberty St. to replace storm water drain.

Huntington, Ind.—Board of Public Works has decided that sewer on Frederick St. is a necessity. Board has ordered construction of sewer and promised that intercepting sewer will be built in Little River within a year to carry sewage below town before it is emptied into Little River.

Markle, Ind.—Plans for extensive sewer system in Markle have been submitted to town board by Thomas Ruggles, Markle's civil engineer. He has prepared general plans, profiles, specifications, etc., after exhaustive study of situation and his report to town board will contain all information necessary. In entire system there will be 7,300 ft. of sewer, 2,400 in main line on Sparks St., 1,900 ft. on Clark St., and two lines, one on either side, on Lee St., each 1,500 ft. long. The Lee St. sewer is to be constructed in two lines because a concrete pavement will be laid, and the setting of one big sewer in the usual place, the street's center, would cause it to crack. Mr. Ruggles' specifications are for first-grade vitrified tile, with water cemented joints.

South Bend, Ind.—At meeting of board of public works bids were submitted for construction of sewer on Benton St. by A. M. Smith, of Elkhart and Staples & Ackerman, of South Bend. The bids were referred to City Engineer Charles Cole.

Clinton, Ia.—Bids will be advertised for a sewer cleaning machine.

Lenox, Ia.—Resolution is being considered for sewer improvements consisting of an outlet sewer and disposal plant, about 3,800 lin. ft. 12-in. sewer, 4,200 lin. ft. 10-in. sewer, 23,000 lin. ft. of 8-in. sewer and 1,300 lin. ft. 6-in. sewer, cuts ranging from 4 to 20 ft. Resolution will be considered on June 18, 1915. Theo. S. De Lay is civil engineer.

Topeka, Kan.—City commissioners have voted unanimously for resolution and ordinance for East Side sewer, as proposed at the morning session.

Monroe, La.—See "Miscellaneous."

Huntington, Mass.—It has been voted to authorize treasurer to borrow \$4,500 for construction of drainage system on Pine, Pleasant and Crescent Sts.

Kalamazoo, Mich.—See "Streets and Roads."

Eveleth, Minn.—City is ready to receive bids for construction of septic tank at sewer outlet. Frederic E. Bass, the engineer employed to prepare plans, has them completed. Pat Boyle, assistant city engineer, has located position of tank and contract can be let at early date.

Carthage, Mo.—City engineer has been directed to prepare plans and specifications for sewer in district No. 52.

Joplin, Mo.—Proposals for two storm sewers have been discussed at meeting of City Council. One of sewers proposed will be on East Seventh St. and will take care of bad drainage problem there. Other would be on Sergeant Ave. from Ninth St. to Willow branch.

Maywood, N. J.—Election resulted by vote of 130 to 31 in favor of issuing 5% sewer bonds in sum of \$93,500. Charles Staas is Borough Clerk.

Binghamton, N. Y.—Alderman Charles H. Bone will introduce ordinance in Common Council declaring intention of Council to construct sewers on Hill St. and Phinn Ave. in Sixth ward. Ordinances will be referred to committee on sewers and sewerage for approval.

Binghamton, N. Y.—Sewer will be constructed in Manier Ave., to cost \$415.

Freeport, L. I., N. Y.—Taxpayers will vote on bond issue of \$150,000 for sewer

system. Freeport is not alone considering installation of sewer system with a disposal plant like Hempstead has. Eight other villages on Long Island are considering the problem. Whether Freeport votes yes or no for a sewer at this time, the time must soon come when sewer system must be installed. It is plan of state department to conduct campaign of education in sewage disposal on the island.

Hlon, N. Y.—Election has resulted by vote of 180 to 12 in favor of issuing sewer bonds in sum of \$30,000. F. W. Bellinger is Village Clerk.

Bowling Green, O.—Ordinance has been adopted determining to proceed with construction of storm water sewer in Pearl St. in city of Bowling Green.

Toledo, O.—Ordinance has been passed to construct Local Sewer No. 1254 in alley S. W. of Buffalo St., etc.

Harrisburg, Pa.—Dr. Samuel G. Dixon, state commissioner of health, has issued series of approvals and decrees affecting sewerage and water service of number of Western Pennsylvania communities, the governor and attorney-general uniting in approvals. Among approvals was plan for improvement of sewers of Monongahela City on which considerable time has been spent and which will be part of general scheme for betterment of conditions in that city. Plans for sewers of South Connellsville, for water works system of Port Vue, for works of Citizens' Water Company of Scottsdale, water works of the New Wilmington Water Supply Co., at New Wilmington, Lawrence County, and sewage treatment plant of North East, Erie County, have been approved.

Johnstown, Pa.—Following ordinance will come up for final action June 29, providing for loan of \$150,000, to be used and expended for the payment of part of the cost and expense of building and constructing a general sanitary sewer system in city of Johnstown, and providing for annual tax for payment of said loan and interest.

Cleveland, Tenn.—City, C. A. Mee, mayor, has rejected bids received June 16 for \$75,000 sewer bonds and \$15,000 city hall bonds, and is now entertaining other proposals for sale of these bonds. For design and supervision of construction for these sewers, Walter G. Kirkpatrick, of Birmingham, Ala., has been appointed engineer. Elmar Bartlett is city recorder.

Cleburne, Tex.—Negotiations are under way for purchase of 75 acres of land 2 miles south of city, to be used by city as a sewer plant.

Norfolk, Va.—On report of City Engineer W. H. Taylor finance committee decided to recommend appropriation of \$900 for concrete work in repairing discharge drain in Rothery's Lane, between Main and Water Sts.

Odannah, Wis.—A congressional appropriation for purpose of improving sanitary conditions on Odannah reservation is being expended in improving streets and improving Bad river here. The Stearns Lumber Co. has contract for work which will be paid for out of allowance of \$8,000.

CONTRACTS AWARDED.

San Francisco, Cal.—To Healy-Tibbitts Construction Co., at about \$65,000, for sewer in 5th St.; Howard to Brannan.

Portland, Ind.—Contract for Bourne drain, in Jackson and Penn Townships, has been awarded to Joseph Van Skyock at \$1,345. The engineer's estimate for work was \$1,775.

South Bend, Ind.—For construction of 220 ft. of 10-in. vitrified pipe sewer, to Henry De Vos at \$231.85.

Hartley, Ia.—To Arthur A. Dodson & Co., Lincoln, Neb., at about \$19,000, for installation of sewerage system.

Baltimore, Md.—To A. T. Carozza Co., city, at \$76,798, for lateral sewer work south and east of Patterson Park, also for sanitary sewers at Ferry Point, South Baltimore, to cost \$87,654.

Duluth, Minn.—Contract for laying a sanitary sewer in alley between Olney and Tacony Sts. and 61st and 63d Aves. west has been awarded to Gust Hiner on his bid of \$1,166.84.

Little Falls, Minn.—Contract for construction of Second St. sewer has been awarded by Board of Public Works to Grand Forks Concrete Co., of Grand Forks, N. D., for \$3,773.50.

Caruthersville, Mo.—To construct sewer system to A. C. Brown, of Herrin, at \$41,600. Engineer is Frank L. Willcox, St. Louis.

Bayonne, N. J.—Contractor C. J. Cogan having abandoned work on sewer under construction Hobart Ave., between 54th and 55th Sts., the City Commission has assigned Contractor John T. Kavanagh to complete work at cost of \$2,667.73.

Oswego, N. Y.—To Arthur J. Shaw, Jr., Batavia, at \$22,441, for construction of sanitary and storm water sewers: 505 ft. 36-in., 240 ft. 33-in., 294 ft. 30-in., 306 ft. 24-in. lock joint pipe, 294 ft. 20-in., 50 ft. 18-in., 503 ft. 15-in., 778 ft. 12-in., 1,947 ft. 10-in., and 10,448 ft. 8-in. vitrified tile pipe, 497 Y branches, 35 man-holes, 14 flush ends, etc.

Utica, N. Y.—A. W. Fitch has been awarded contract for constructing sewer in Oneida St. from Parkway to Margaret St., at meeting of Board of Contract & Supply. The bids received were: Domenico Pirritano, \$619.25; F. M. Johnston, \$576.25, and A. W. Fitch, \$460.90.

Bismarck, N. D.—Bids on sewer construction work on Broadway from Tenth to Fourteenth St. have been opened by City Commissioners and contract awarded to Haggart Construction Co. of Fargo, the lowest bidder. Bids submitted were as follows, all of them including cost of lift which is to be put in: M. P. Moore of Bismarck, \$17,035.30; Grams & Peet Co., of Bismarck, \$18,429.50; Grand Forks Concrete Co., \$15,987.93; Haggart Construction Co., \$15,107.50.

Cleveland, O.—For construction of sewer in Spring Rd., to Wm. McDowell & Son Co., at \$17,000.

Cleveland, O.—For construction of a sewer in Kingsburg run culvert extension from E. 75th St. to Amata Const. Co., at \$2,550, and to same firm for sewer in W. 17th St., at \$800, and sewer in Dugway Brook branch at \$1,775.

Cleveland, O.—For construction of sewer in W. 105th St. to Wm. Lehmann at \$53,000.

Cleveland, O.—By Bd. of Control for construction of drain at Division Ave. filtration plant, to John F. Casey Co., Cleveland, at \$8,744; to Chas. H. Bennett, for sewer in Jennings road, S. W., at \$25,000.

North Bend, Ore.—For construction of vitrified clay sewer pipe following are two lowest bids received: Edward Sandberg, Portland, Ore., at bid of \$16,438.84 and James Kennedy, Portland, at \$17,929.44. Chas. E. Maybee is Recorder.

Connellsville, Pa.—Sewer pipe and connections will be purchased from McFarland Supply Co., of Greensburg, and the Kennedy Co., of Pittsburgh.

Hazleton, Pa.—For extending Locust St. sewer with reinforced concrete pipe to Reed Construction Co. at \$4,575.

Johnstown, Pa.—Contracts for the laying of sewers have been awarded to M. M. Sheesley & Sons as follows: Somerset St., at \$642.84; Dibert St., at \$212.50; Ash St., at \$1,626.82; Central Ave., \$940.51; to George W. Clarke; Napoleon St., \$503.05, Schenkemeyer & Sons; Grant St., \$1,125.36, R. A. Reighart.

Williamsport, Pa.—Council has approved resolutions awarding contracts for sewers to following contractors: Menne Alley house sewer, to Charles Duggan, at his bid of \$174; Front St. house sewer and Campbell St. storm water sewer to Joseph McCadden at his bids of \$283 and \$203.70 respectively.

Woonsocket, R. I.—For surface water drains in S. Main, Old Cottage and other streets to Brien & Bouvier, of Woonsocket, at \$7,400.

Chehalis, Wash.—Six bids have been presented to city commission for building of Prindle St. trunk sewer from near St. Helens Ave. to river outlet. Contract was let to Hurd & DeCamp, of Spokane, for \$17,572.20. Engineer's estimate of cost was \$25,000.

Spokane, Wash.—W. J. Hoy & Co. has sublet contract for sewer changes at Sprague Ave. and Division St. to Dixon & Oliver, of Spokane. Cost about \$25,000.

Green Bay, Wis.—To C. P. Flatley, of Green Bay, for constructing sewer on 9th St., at \$11,071.

WATER SUPPLY

Gadsden, Ala.—The water committee of City Council has decided to report favorably plan to extend water mains on four streets in West Gadsden. Improvement will cost about \$6,000.

Pasadena, Cal.—A chlorine plant will shortly be installed to cost about \$1,500.

Dennison, Ia.—Plans are being made for water works improvements, for which \$20,000 has been voted.

Osage, Ia.—Osage will have municipal ownership of its water system. The private corporation owning the plant is going out of business and city will take it over.

Covington, Ky.—Covington City Commissioners have enacted ordinance for sale of the \$200,000 water works improvement bonds authorized by vote of the people at last election.

Monroe, La.—See "Miscellaneous."

Holyoke, Mass.—To build another reservoir between old Pomer and new White reservoirs is present plan of water board. The new reservoir will be fed partially from White reservoir. Its construction will cost about \$30,000.

Lowell, Mass.—Following bids have been received for 8,000,000-gallon pump engine for water works department: Holly Mfg. Co., Buffalo, N. Y., \$19,975, and Allis-Chalmers Co., Milwaukee, \$22,950.

Kalamazoo, Mich.—City will install more than a mile of water main extensions in outlying districts of city during summer, according to resolutions which have passed Council. Resolutions providing for expenditure of \$4,722.25, which will be drawn from the revenues of water department, were offered by Alderman Cornelius Verburg. Following were confirmed: Lincoln Pl., 450 ft.; North West St., 1,150 ft.; Clark St., 1,300 ft.; North Rose St., 400 ft.; North Park St., 810 ft.; Hillcrest, 925 ft.; March St., 350 ft.

Duluth, Minn.—Ordinance has been passed to appropriate from public utility fund sum of \$4,900 for purchase of gas and water gates and boxes, Smith's sleeves and valves, and hydrants for season of 1915.

Robbinsdale, Minn.—Installation of a water works system to consist of a power plant, 100,000 gal. tank and tower, 5,000 to 10,000 ft. of mains and other equipment is contemplated.

Billings, Mont.—City may shortly advertise for furnishing and laying about 3,000 ft. of 20-in. cast-iron pipe.

Morrisville, N. J.—Because of decree of state board of health in directing borough authorities to have erected a modern filtration plant here, by which water which is used from Depaware River may be purified, a special election will have to be held when voters will decide whether local borough council can borrow \$20,000 and issue bonds for that amount to pay for this plant and needed improvements around water works, which will be made necessary by erection of this plant.

Lockport, N. Y.—Resolution has been adopted in which board recommends to common council that four bids received by latter for construction of the 12 and 10-inch water mains in Market and Mill Sts. be rejected and that board advertise for new bids under new plans and specifications to be prepared by city engineer under its direction. Bids received were as follows: J. B. Whitmore Co., \$16,600; F. J. Le Valley, \$16,600; C. N. Stainthorpe & Co., \$18,990, and Henry W. Golden & Son, Troy, \$18,325. The Council has referred the bids to its street committee.

Oakfield, N. Y.—Plans for village water system have been practically completed under direction of consulting engineer H. C. Kittredge, of Rochester. Village Board of Trustees, which is also the Board of Water Commissioners, will receive sealed proposals for purchase of bonds to amount of \$35,000 until June 22, and bids for construction of various parts of system until June 24.

Oswego, N. Y.—Taxpayers at special election gave approval of special bond issue of \$35,000 for water purposes.

Wilson, N. C.—Election will be held July 6 to vote on question of issuing water works plant in sum of \$95,000.

Attica, O.—On July 12 village will vote on \$10,000 bond issue for improvements to water plant.

Coshocton, O.—Councilmen have passed ordinance issuing \$40,000 to provide funds for city's new water reservoir. These bonds will be sold after ordinance has been advertised thirty days. City then must advertise for bids on work for two weeks. Contract should be let by Aug. 1.

Youngstown, O.—City council has passed ordinance authorizing bond issue of \$100,000 to complete local water works improvements. As explained to council by Service Director Heasley, money is to be used to rebuild 12 old filter beds and to raise power machinery at filter plant so that all will be

above high water mark, to build trestle from elevated B. & O. tracks to boilers of new pumping station and to make other improvements.

Florence, Ore.—Water system and street intersection bonds have been carried at election, two to one, and bonds for city hall and jail lost by small majority. Ten thousand dollars was voted for water system. Street improvement work that has been held up for months can now be completed.

North Powder, Ore.—Bonds in sum of \$20,000 for installation of water works system may soon be voted on.

Orangeburg, S. C.—Election will be held June 29 to vote on question of issuing water bonds in sum of \$15,000.

Irene, S. D.—City clerk will receive sealed bids until July 1 for not exceeding 6% water works bonds in sum of \$12,000.

Columbus, Tex.—Election has resulted by a vote of 87 to 2 in favor of issuing 6% water works bonds in sum of \$9,000.

Dallas, Tex.—Not less than twelve men will be sent by Dallas Chamber of Commerce to Washington as committee to urge appropriation of \$500,000 to complete two unauthorized locks and dams in Trinity River.

Ogden, Utah.—The Utah Construction Co. is making preliminary arrangements for construction operations on big dam at East Canyon creek reservoir of Davis & Weber Counties Canal Co., near Morgan. It is project of large proportions and will require considerable machinery to do the job. The dam will be of steel reinforced concrete from the base to top and it is said that it will be among most substantial reservoir dams of intermountain country. Contract price of dam is about \$115,000, but canal company will expend from \$25,000 to \$35,000 in addition, which will bring actual cost of structure to about \$150,000, amount of bonds for improvement. When completed dam will increase capacity of reservoir from 14,000 to 27,000 acre-feet.

Raymond, Wash.—Plans for giving Raymond a gravity water system have been started by city council when ordinance was passed appropriating waters of south fork of Willapa River for municipal purposes and condemning 190 acres about five miles south of city to be used for storage purposes, and where it is proposed to build necessary dam. City recently voted \$117,000 in bonds for purpose of taking over present water works, and it is expected that it will require additional \$100,000 to complete gravity system, which will furnish water sufficient to accommodate city of 20,000 people.

Snohomish, Wash.—Finance committee of city council and city clerk have made arrangements for sale of its city water bonds of water district No. 1 for improvements in system made about the city last year.

Niagara Falls, Ont., Can.—Chairman Harry Hobson of board of health has said that board would recommend installation of chlorinating plant in connection with Falls water works similar to plant at DeCew Falls. This plant, in which all water supplied to St. Catharines is chemically treated, cost about \$1,000.

CONTRACTS AWARDED.

San Diego, Cal.—Power Equipment Co., Rialto Bldg., San Francisco, to install water and sewer system at naval station, at \$10,650.

Hartford, Conn.—Following is unit price of lowest bid opened June 2 by Bd. Water Comrs. (Caleb M. Saville, Ch. Engr.), for constructing east dike Ne-paug reservoir, Contract 9, in Town of Canton. Successful bidder was Leonardo Suzia, Meriden, \$29,180. 25 acres clearing, \$40; 10 acres grubbing, \$60; 1,000 cu. yds. earth excav. in trench, 0 to 10 ft. deep, 50 cts.; 350 cu. yds. earth excav. in trench, 10 to 18 ft. deep, \$1; 350 cu. yds. earth excav. in trench below 18 ft. deep, \$1.80; 2,000 cu. yds. earth excav. not included in above, 38 cts.; 400 cu. yds. rock excav., \$2.50; 200 sq. yds. spec. prep. of rock surface, 50 cts.; 12,000 cu. yds. refill. and embanking soil, 35 cts.; 4,700 cu. yds. refill. and embanking coarse gravel, 40 cts.; 12,000 cu. yds. refill. and embanking misc. materials, 33 cts.; 4,000 cu. yds. surface dressing and grassing, 70 cts.; 1,800 cu. yds. concrete masonry, Class A, \$3.80 75 cu. yds. concrete masonry, Class B, \$5; 2,200 bbls. Portland cement, \$1.40; 500 lin. ft. haul and laying c.-i. pipe and specials, 85 cts.; 225 lin. ft. remove 8-in. c.-i. pipe, 50 cts.; 4,500 lbs. metal for rein-

forcing, 4 cts.; 800 lbs. misc. cast iron, wrought iron and steel, 6 cts.; 100 lbs. bronze and copper, 40 cts.; 1,200 sq. yds. 6-in. gravel surface, 25 cts.

Herrin, Ill.—To Pittsburgh Filtration Co., Pittsburgh, Pa., to construct filtration plant at city reservoir at \$18,107.

Rock Valley, Ia.—For erection of 30,000 gallon steel tank and tower to Des Moines Bridge & Iron Works, Des Moines, Ia., at \$2,626.

Spillville, Ia.—To Des Moines Bridge & Iron Works, Des Moines, for 30,000-gal. tank and tower at \$7,469, and for 60,000-gal. concrete reservoir at \$5,593. A. A. Novak is Town Clk.

Great Barrington, Mass.—Contract for laying new water main from Berkshire Heights reservoir to Brainard Ave. has been awarded to Way & Cellilli, of Springfield.

Lowell, Mass.—Purchasing Agent Foye has awarded Carroll Bros. contract for quantity of piping, T's, elbows and bushing for use in water department, they being lowest bidders. Bids received were as follows: Welsh Bros., \$475; Harry S. Drury, \$455; Farrell & Conaton, \$457.52; Bramon, Dow & Co., \$432.63, and Carroll Bros., \$432. Latter company specified galvanized elbows.

Taunton, Mass.—Contract has been awarded to L. M. Witherell & Sons, for construction of 22 by 30 addition to Lakeville pumping station of Taunton water department. Their bid was \$2,785. The addition is for new boiler to be installed.

Turners Falls, Mass.—Fred T. Ley & Co., of Springfield, have been awarded contract to build other half of Turners Falls Power & Electric Co.'s dam this year. Same firm has been building new power house at Montague City.

Marion, Mich.—To Traverse City Iron Works, contract for installation of water works system. Contract calls for 60,000 ft. of pipe, 12 hydrants, a 30,000 gal. tank and other equipment. Price is \$7,500.

Caruthersville, Mo.—For extensions and improvements to water works to Monie & Dunbar, Chemical Bldg., St. Louis. Frank L. Wilcox is Engr., Syndicate Trust Bldg., St. Louis.

Winside, Neb.—To Gus G. Wendt, city, at \$885, for installing 1,200 ft. of 4-in. water mains and 3 fire hydrants.

Jersey City, N. J.—By Hudson County Park commissioners following contracts: Watson-Flagg Engineering Co., 27 Thames St., New York City, pumps, etc., \$5,713; Wm. Robertson & Son, Inc., 15 Exchange Pl., Jersey City, pumping station, \$2,898; bids for filter house were rejected.

Troy, N. Y.—For laying of 9,000 ft. of mains to Martin Murray & Co., Troy, at \$4,865.

Cleveland, O.—For filter sand and gravel for Division Ave. filtration plant to Cleveland Macadam Co., at \$20,450.

Cleveland, O.—For cantilever runway for crib No. 5 of division of water to Republic Structural Iron Works at \$1,190.

Dayton, O.—Contract for sleeves and valves for use in water department has been awarded to A. P. Smith Mfg. Co., East Orange, N. J. (Correction of item in June 17 issue.)

Umatilla, Ore.—To Pike & O'Neil, Portland, to construct distributing system for water supply system to be installed in city by Oregon-Washington Railroad & Navigation Co., to cost about \$10,000.

Ipawich, S. D.—For construction of concrete reservoir to Tanner Bros., of St. Paul, Minn. Engineers are Dakota Eng. Co., of Mitchell.

Ennis, Tex.—City Commission has let contract to Chicago Bridge and Iron Works to erect a 100,000-gal. water tower at cost of \$4,190.

Temple, Tex.—At special session of City Council contract for constructing concrete dam and spillway over Leon River for the city waterworks plant was awarded to P. G. Burns of Houston on his bid of \$16,460, which was lowest of eight submitted.

Fennimore, Wis.—For furnishing waterworks plant with three pumps and motors to Western Pump & Engineering Co., Chicago, Ill., at \$1,900.50.

Waband, Wis.—To Lowell & Chaffee, of Rhinelander, for installation of water works system.

LIGHTING AND POWER

Birmingham, Ala.—Julian Kendrick, city engineer, has been directed by city commissioners to ascertain cost of

hydro-electric plant on Warrior River at Lock No. 17, to be established to furnish light and power for city.

Birmingham, Ala.—Petition for franchise to do electric light and power business in Greater Birmingham has been presented to city commission by Hugh Friel, president, and Sydney J. Bowie, attorney, of Birmingham Water, Light & Power Co.

Los Angeles, Cal.—Council on June 30 will consider protests against ornamental lighting of Arlington St. and West Chester Pl., between Pico and 12th Sts.

Pasadena, Cal.—First reading has been given resolution of intention to install ornamental lighting system on Bellefontaine St. between Fair Oaks and the Arroyo Seco.

South Norwalk, Conn.—Installation of ornamental street lighting system in a section of town is being considered. It is proposed to use combination poles with arms for tungsten lamps, poles to be extended upward so as to carry wires and trolley span wire supports. Plans are also being considered for installation of 250-kw. motor generator set, receiving current at 11,000 volts alternating current at motor, and delivering 230 volts to 270 volts direct current at generator end. A. E. Winchester is general superintendent.

Toccoa, Ga.—Citizens have recently voted in favor of bond issue of \$35,000 for building municipal electric light plant.

Soda Springs, Ida.—Election has resulted in favor of issuing electric light plant bonds in sum of \$15,000.

Alton, Ill.—First steps towards what appears to be agitation for municipal lighting plant for city of Alton has been taken when resolution was presented to Council, asking that committee of five be appointed to confer with representatives of Keokuk Power Co. in regard to supplying city with current for lights.

Springfield, Ill.—Installation of ornamental lighting system on Sixth St. is being considered.

North Vernon, Ind.—City council plans to put in additional engine and generator and to remodel electric light plant at cost of \$15,000.

Tipton, Ia.—Election has resulted in favor of issuing light plant purchase bonds in sum of \$23,000. J. E. Bartley is Mayor.

Greensburg, Kan.—Bond election was almost unanimous, being 315 to 13 in favor of electric light bonds.

Haviland, Kan.—Haviland has called bond election for 26th of this month to vote bonds for building their part of electric light and power line from Greensburg. Each city builds to their limits and company organized for that purpose completes the line.

Stafford, Kan.—To induce residents to become users of electric current, Council has decided to do electrical wiring of residences at cost and collect amount in ten monthly instalments.

Monroe, La.—See "Miscellaneous."

South Hadley, Mass.—Bids will be received until June 21, by board of electric light commissioners for electrical apparatus, including a 75-hp. Ball steam engine, three generators, exciters, switches, etc.

Flint, Mich.—Street lights have been recommended by lighting committee of Common Council to be placed at the various places.

Grand Rapids, Mich.—South Division Center Improvement Association has taken steps for installation of ornamental lamps on Division Ave. from Wealthy St. to Hall St. Cost of system is estimated at \$18,800.

Grand Rapids, Mich.—Boulevard lights now are assured in Lyon, Huron and Pearl St. section of city, as result of better lighting campaign inaugurated by George W. Thompson. Kent county auditors have decided to erect standards and place lights around county's property, Crescent St. and Ottawa Ave., in compliance with petition filed by Mr. Thompson.

Highland Park, Mich.—The Peninsular El. Lt. Co., of Detroit, has offered proposal to Village Council for installing ornamental lighting system on Woodward Ave. Plans call for ornamental standards carrying 1,000-cp. incandescent lamps, to cost about \$12,000, work to be done by company.

Kalamazoo, Mich.—Mayor Balch's selection of F. W. Ballard, manager of municipal lighting plant of Cleveland, O., to conduct extension work in connection with local electric plant, has received confirmation of Common Council.

Three Rivers, Mich.—It is said that plans have been submitted by George Champe, civil engineer, of Toledo, O., for construction of municipal electric-lighting plant and water-pressure plant, for which \$50,000 in bonds have been voted.

Danube, Minn.—Village Recorder Henry J. Stange will receive sealed bids until June 25 at 8 p. m. for 5% electric light bonds in sum of \$2,500. Denomination \$500.

Duluth, Minn.—Gas and water mains have been ordered laid in Ninth St., from Seventh to Eighth Ave. east, and in Tenth St. from Sixth to Seventh Ave. east.

Duluth, Minn.—Commissioner Merritt has introduced ordinance appropriating \$5,000 for purchase of gas meters.

Maryville, Mo.—The Mound City Light & Ice Co., which has been engaged to extend electric current to Graham, Maitland and Skidmore, has installed a line as far as Maitland and is pushing work northward towards Skidmore.

St. Joseph, Mo.—A \$50,000 addition to city lighting plant is advocated by Mayor Marshall.

Anaconda, Mont.—A resolution establishing another improvement district which will extend lighting system on Main St. so that it will extend from Butte, Anaconda & Pacific depot to the Deer Lodge County court house has been passed.

Bozeman, Mont.—City Council has adopted resolution for installation of street lighting system on Main St. Plans call for erection of 46 standards carrying five-lamp clusters, and 74 combination lamp and trolley poles; 526 lamps of 60 cp. will be used. Cost of system is estimated at \$14,737.

Hastings, Neb.—Water and light committee has been instructed to secure bids for 750 k. w. turbine generator and report to Council. Commissioner Watson estimated cost of machine at \$12,000 and total cost of installation, including condenser, switchboard, etc., at \$17,500.

Binghamton, N. Y.—Mayor has vetoed ordinance passed by council directing board of estimate and apportionment to offer for sale \$148,200 worth of municipal lighting bonds. The legality of the veto is being questioned.

Little Falls, N. Y.—Boulevard system of lighting is being favorably considered.

Little Falls, N. Y.—Representatives of city, the Utica Gas & Electric Co., and the New York State Railways met in conference at Common Council chambers in this city to consider feasibility of boulevard lights on Main St., from Alexander to 6th St. They stated that the fairest and best way out of it would be for each to pay third of cost for installation of such system. It is estimated that the total expense will be from \$7,500 to \$8,000.

Ogdensburg, N. Y.—Mayor Julius Frank and members of fires and lights committee of Common Council made tour of inspection and found conditions very much as described by persons who have filed petitions recently. An effort will be made to draw up agreement with Power & Light Co. for number of new lights. It has been suggested that about 300 incandescent globes be added at estimated cost of \$300 a year.

Syracuse, N. Y.—Board of contract and supply has ordered advertisement for bids for lighting Fayette Park, which will be only increase in ornamental lighting district. Twenty single standards are to be erected.

Wilmington, N. C.—Committee to investigate and report on matter of securing more modern and effective system of street lighting for downtown business district has been appointed by Mayor Moore at weekly meeting of City Council.

Columbus, O.—Public Utilities Commission has authorized Ohio Power Co., successor to Sandusky River Power Co., to issue \$700,000 first mortgage bonds. Proceeds are to be used in installing new 15,000 kw. steam generator, estimated to cost \$600,000, and in the payment of receiver's claims and old bonds and other indebtedness having face value of \$300,000.

Toledo, O.—Various streets will be improved by installation of electric lights.

Chickasha, Okla.—The Washita Oil and Gas Co. has been formed in this county and will take out charter.

Hazleton, Pa.—Extension of mains of Luzerne County Gas & Electric Co. to Hazleton Heights section is planned by local officers of that company. Work will require laying of 10,000 ft. of main which, combined with laying of 2,000 ft. in the city, will make total of 12,000 ft. of pipe to be laid in this city during summer season.

Stonycreek, Pa.—Bids will be received by commissioners of Stonycreek Township for placing of six electric street lights of 80 candle-power each, in Township of Stonycreek, in accordance with Ordinance No. 17. Fred Heilman, Clerk, R. D. No. 3, Johnstown, Pa.

Williamsport, Pa.—City Council will make provision in specifications for street lighting now being considered, for boulevard lighting system. In consideration of specifications in committee of the whole section describing style of lights to be used was added to, to include boulevard lights of different kinds.

Williamsport, Pa.—When Council met in special session the new electric street lighting specifications were presented and Councilman Meyer promptly moved that C. L. Kinsloe, the expert be employed by city to draw the specifications.

Orangeburg, S. C.—Election will be held June 29 for voting on question of issuing \$15,000 in bonds for improvement of municipal electric-light plant. Edward Howes is city engineer.

Dallas, Tex.—Municipally-owned electric light plant is favored by Mayor H. D. Lindsley.

Bluefield, W. Va.—Installation of municipal electric-light plant is being considered by City Council.

Ephrata, Wash.—It is said that C. J. Weller, of Wilson Creek, will install electric-lighting system. City Council will negotiate with Mr. Weller for installation of street-lighting system, consisting of 30 lamps of 100 cp.

Janesville, Wis.—Citizens are enthusiastic over plan to change present lighting system of city, install lights in resident districts on every corner and new lights, either ornamental or something of later pattern, in business district.

Sheboygan, Wis.—At recent joint meeting of civic and county affairs committee and streets and roads committee and special committee from Sheboygan Business Men's Association, the concrete post was adopted for street lighting system on 8th street.

New Liverpool, Que.—City is said to be considering establishment of new power plant and electric lighting system. J. Hamlin is commissioner.

CONTRACTS AWARDED.

Brooksville, Fla.—By City Council contract for street lighting to Brooksville El. Co., contract to begin early in July.

Ventnor City, N. J.—Council has awarded contract for furnishing of ornamental cast iron lighting standards for Boardwalk. These will replace the old and unsightly wooden standards which have been used for years. The Central Station Equipment Co. of New York secured the contract at their low bid of \$40 each. Because of legal technicalities award for the ornamental standards along Ventnor Ave. was postponed for further consideration. Electric luminous arc lights will be used in conjunction with Boardwalk standards. Contract for furnishing about 25 of these was awarded to the Atlantic City Electric Light Co. at their bid of \$75 each. Bids will be advertised for both gas and electric lighting for all the present gas standards. These will be received at next regular meeting.

Lyons, N. Y.—Council has adopted proposition of Lyons Electric & Manufacturing Co. for lighting public square. The electric company will install six three-light ornamental posts on each side of the square. On top of each pole there will be a 14-in. alabaster globe containing a 150-watt Mazda lamp, which will burn all night. Two arms on pole will have 12-in. alabaster globe containing a 100-watt Mazda lamp.

St. Clairsville, O.—Board of county commissioners has let contract for laying of 1½ miles of gas line leading from main line to infirmary. The contract was let to Ohio Fuel & Supply Co.

Camp Hill, Pa.—By Town Council contract with United El. Co. of Lemoyne, for lighting streets of town. Lamps of 32 cp will be used.

Highland Park, Tex.—By City Council to Dallas Electric Light & Power Co.

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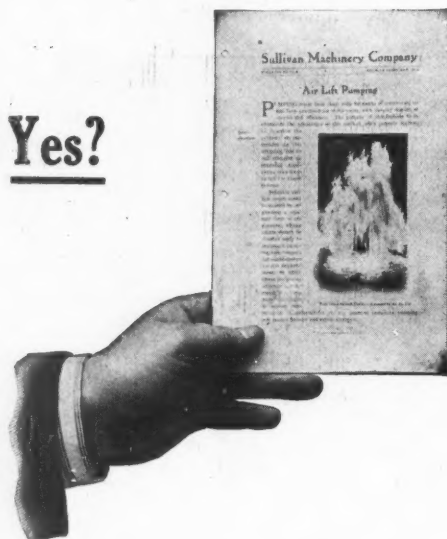
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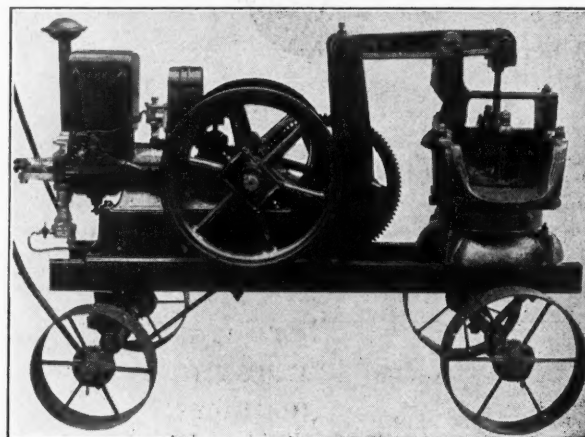
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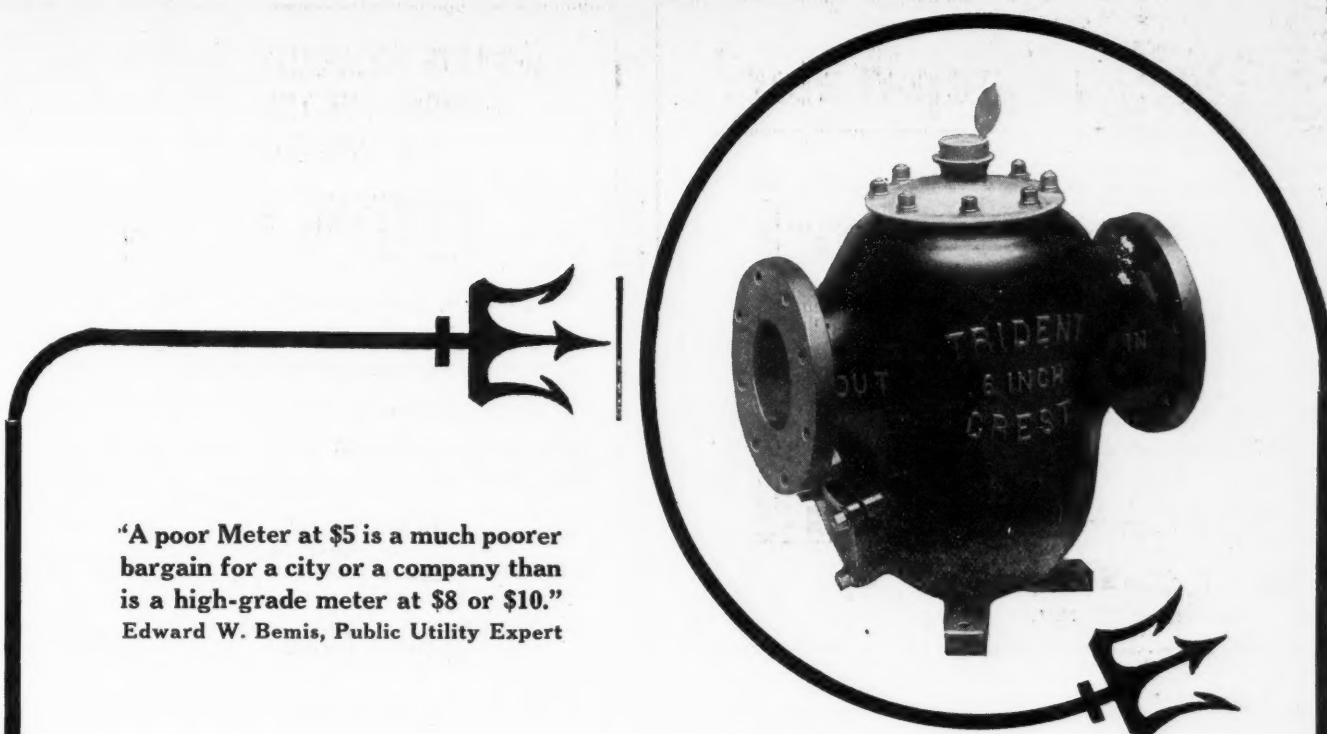
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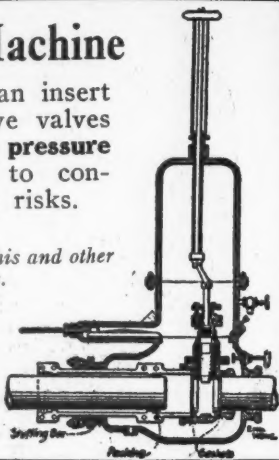
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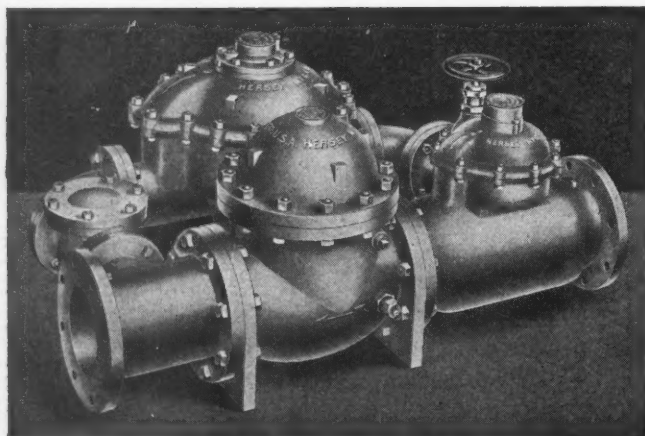
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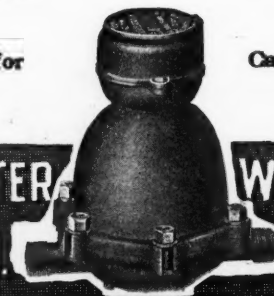
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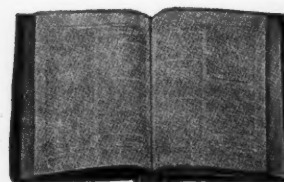
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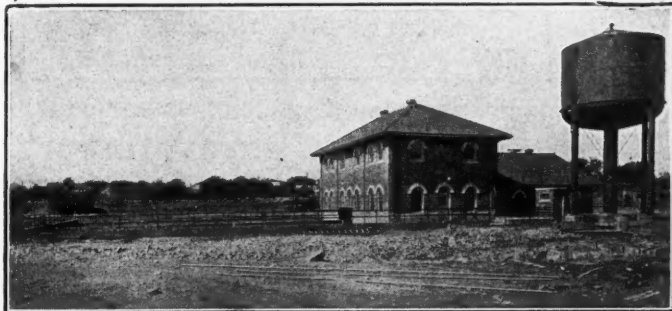
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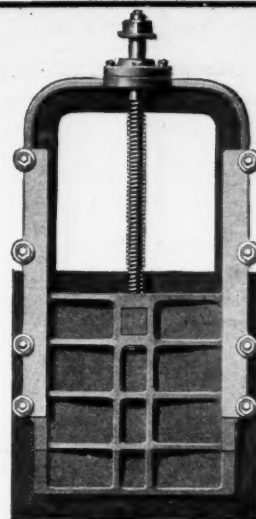


FIG. 4.

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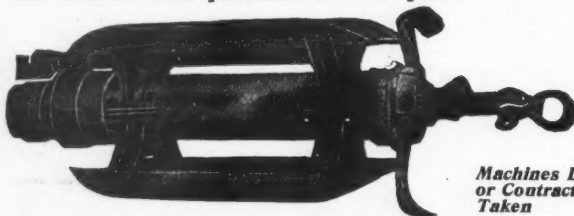
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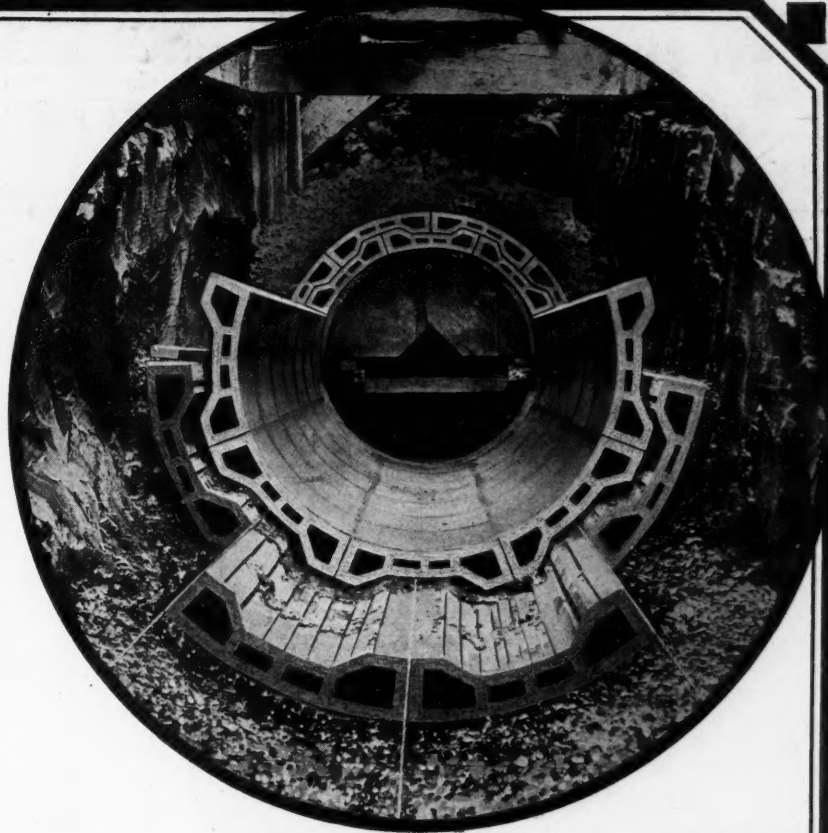
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For example, the days of wet trenches that can never be estimated in advance. You can prevent these from holding up the work and adding to the time and cost of a sewer's construction by building of NATCO LOCK-JOINT SEWER TILE. Whenever and as long as wet trenches prohibit laying of the sewer, you can continue assembling the Tile in half or whole sections in preparation for laying.

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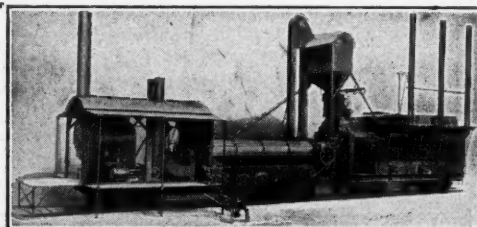
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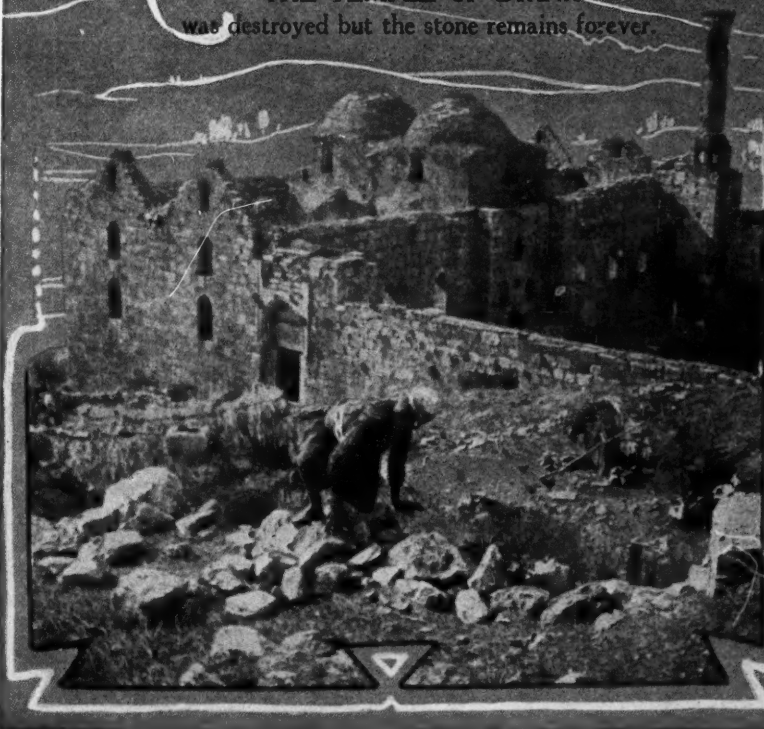
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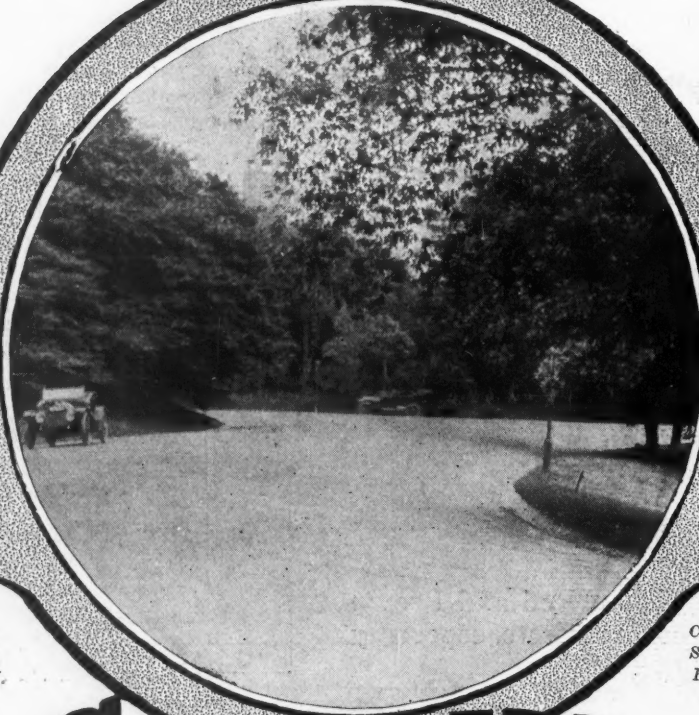


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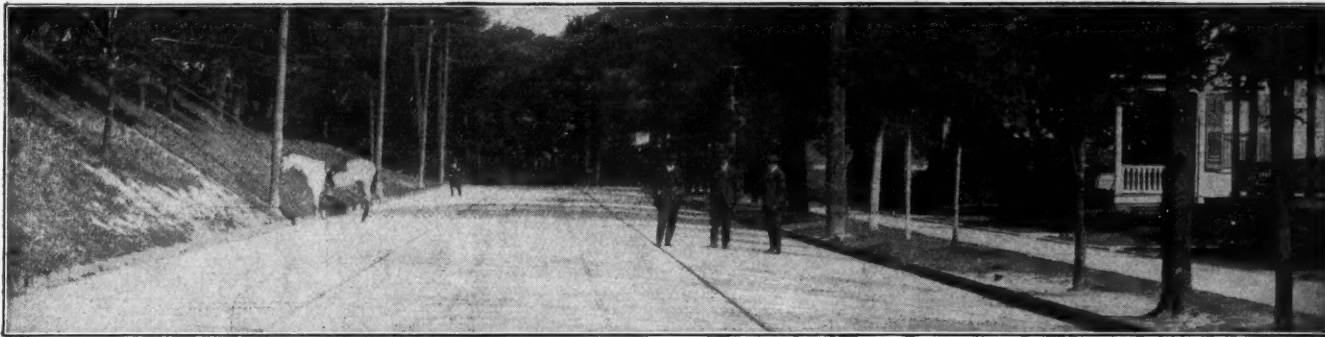
26 BROADWAY, N. Y.



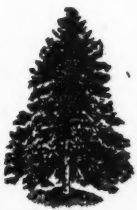
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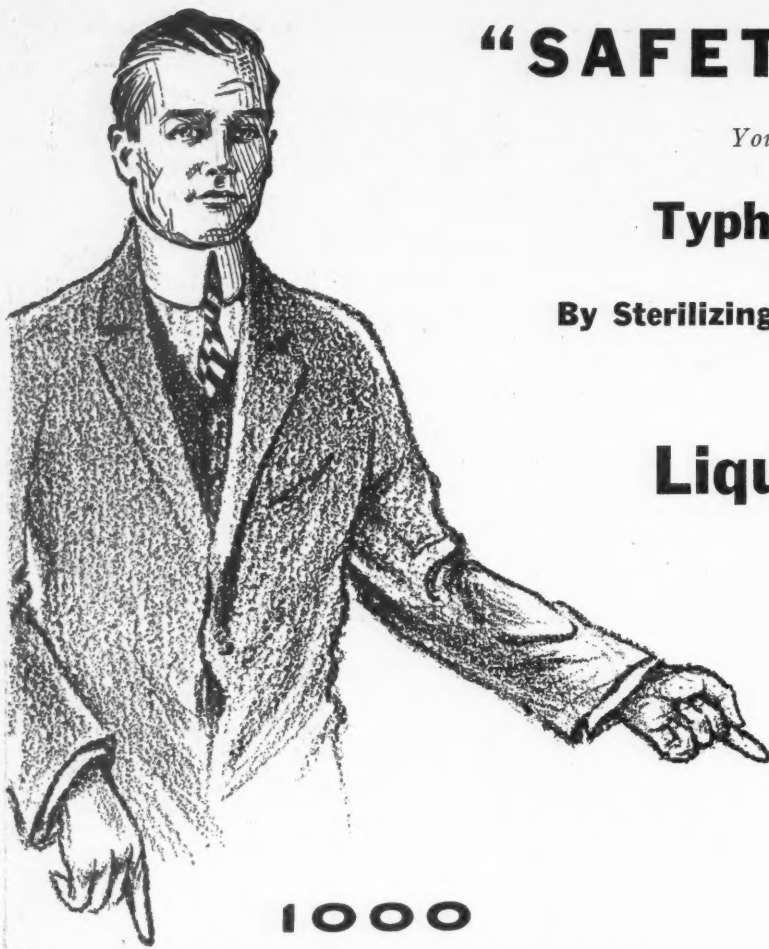
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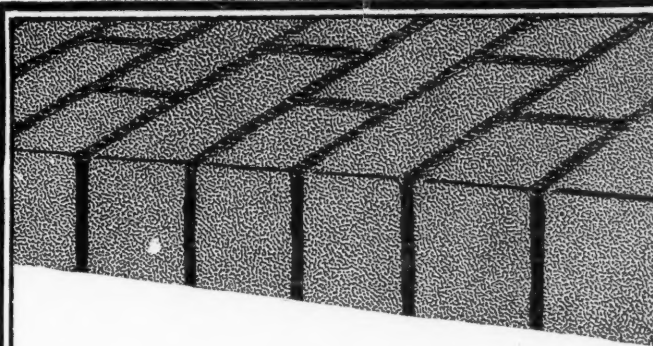
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the blocks contract, the joints widen, the pitch sinks and keeps the seal intact.



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Every Joint an Expansion Joint

THE use of cement grout as a filler for brick pavement attempts to defy one of the oldest laws of nature. In hot weather, brick will expand; in cold weather, contract. When brick and cement are combined in one pavement, making a great monolith, tremendous internal stresses reveal themselves, sometimes by explosion, when the pavement buckles up with a shower of fragments. Sometimes the expansion throws the curb out of line or develops long, unsightly cracks.

To remedy this condition engineers attempted more or less unsuccessfully to provide for expansion by the use of an expansion joint filled with a plastic material.

If the block is of inferior quality the use of cement in the joints may serve to protect the edges from abrasion by traffic, but good brick requires no such protection, especially if the bricks are laid properly, close to-

gether. On the other hand expansion joints, coming at a distance of 8 or 10 feet apart, must necessarily be so wide, in order to take up the great expansion, that protection of the edges is impossible and so in old cement-filled pavements you will find wide grooves running across the pavement at the expansion joint where the exposed edges of the last line of bricks have been hammered into dust.

The use of Pitch Filler instead of cement obviates all these difficulties. Every joint is an expansion joint. In cold weather the pitch sinks in the joint as the block contracts, but as every joint is an expansion joint the amount is infinitesimal. In warm weather the pitch merely rises a little in the joint. In either case the pitch adheres firmly to the block, preserving an absolutely waterproof, perfect seal.

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contract to install 37 ornamental lamps. Cost of system is estimated at \$9,500.

FIRE EQUIPMENT

Martinez, Cal.—City Trustees have decided upon bond issue for \$40,000 to provide adequate fire protection system for Martinez. Matter will be submitted to the voters at an early date.

Redwood City, Cal.—A special election will be held in this city on Tuesday, June 29, to submit question of bond issue of \$7,500 for purpose of purchasing automobile chemical fire apparatus. If bonds carry the fire department will be equipped with an apparatus which will give adequate fire protection to entire city.

Pensacola, Fla.—Plans are being made for new fire headquarters at corner of Spring and Garden Sts.

Pensacola, Fla.—Ordinance providing for issuance, engraving and sale of bonds, under authority of late legislative act, has been passed. This is measure which practically gives city authority to go ahead with issue of bonds for purposes of and in the amount stated in late election. Sum of \$20,000 will be used in construction of a building to shelter the water plant, and sum of \$10,000 will be used in erection of city fire headquarters, etc.

Hickley, Ill.—Fire department is discussing purchase of alarm equipment. Bell on elevated steel tower is favored. William Rees is chief.

Oskaloosa, Ia.—Fire Chief I. H. McCracken has been authorized to purchase 500 ft. of new fire hose.

Leavenworth, Kan.—Loan of \$6,000 is being considered for improvement of Fire Department.

Pittsburg, Kan.—Prices on motor fire fighting apparatus are being considered.

Covington, Ky.—Covington City Commissioners has made their first move toward erecting proposed new fire house in Lewisburg when a resolution was adopted asking for bids to tear down old house at 609 Pike St., site for new fire house.

Jamaica, L. I.—It has been planned to have several new fire-alarm boxes and hydrants installed in Hillside and Jamaica Estates sections.

Auburn, Me.—Taxpayers will decide shortly whether or not alarm system be installed and purchase made of 1,000 ft. of hose.

Annapolis, Md.—Water Witch Hook & Ladder Co. has raised \$3,500 towards purchase of modern hook and ladder truck.

Silver Springs, Md.—Volunteer company has been formed and equipment will shortly be purchased.

Beverly, Mass.—Purchase of pumping engine for central fire station is being planned.

Fall River, Mass.—Aldermen are considering complete motorization of fire department, which is estimated at \$100,000. Under this plan there would be 5 auto pumping engines, 4 auto combination wagons and 4 trucks and 16 more permanent men.

Groveland, Mass.—Town will vote on appropriation of \$800 for purchase of hose for fire department.

Lynnfield, Mass.—On June 22 citizens will vote on appropriation for motorizing fire apparatus.

Newburyport, Mass.—Purchase of motor combination chemical and hose wagon is being considered by a committee.

Calumet, Mich.—Installation of electric alarm system is under consideration.

St. Joseph, Mo.—Fire Chief Kane has asked for money enough to equip at least half of stations with motor apparatus and for erection of fire house at Fourth and Faraon Sts., and another to take place of station at Seventh and Charles.

Concord, N. H.—Board has appropriated \$2,500 for motor apparatus for East Concord.

Concord, N. H.—Petition has been received from West End residents asking that motor pump and hose engine be bought to offset low water pressure in that section. This was referred to committee on finance.

Hoboken, N. J.—Fire Chief Michael A. Dunn is urging purchase of motor pumping engine, tractors for engine and ladder truck, and chasses for four hose wagons.

Linden, N. J.—Fire committee is working on plans to secure adequate fire-

fighting system. Estimated cost between \$15,000 and \$16,000.

Millville, N. J.—Following bids have been opened for installation of fire alarm signal boxes and register in station, with attachments, wiring and the installation of a police signal flashlight system. Fire alarm—Star Electric Co. (bid by error on 14 boxes), \$1,851.93; if wiring be done by city, \$1,153; police signal system, \$337.50; if city do wiring, \$187.50. Fire alarm—Gamewell Fire Alarm Co. (bid on 17 boxes per proposal), \$2,165; if city does wiring, \$1,500; another type, \$1,995; without wiring, \$1,330. The second type is the one used successfully by Bridgeton for many years. Police signal system, \$340; without wiring, \$215. On motion of Mr. Corson bids were laid over for two weeks for further consideration.

Spring Lake, N. J.—Council has passed preliminary resolution looking toward passage of ordinance for special election next month for purpose of giving voters second opportunity to vote upon proposed bond issue of \$9,000 for acquisition of new motor-driven fire-fighting apparatus.

West Orange, N. J.—Town Council will purchase motor triple combination wagon.

Carmel, N. Y.—Fire commissioners will sell \$10,000 bond issue, proceeds to be used for purchase of apparatus.

Middletown, N. Y.—Board of estimate and apportionment has been authorized to purchase fire equipment for Ontario Hose Co. at expense not to exceed \$4,800.

Rensselaer, N. Y.—Public Safety Commission hopes to prevail upon Board of Aldermen to float bond issue for purchase of four auto fire wagons and tractor for ladder truck this year. At present Commission is negotiating with several automobile manufacturing concerns for specifications of their cars. These will be carefully studied and data obtained will be presented to Common Council along with requisition for bond issue.

Rochester, N. Y.—Purchase of another 1,000 ft. of hose, a new set of scaling ladders and an electric fire signal.

Bellaire, O.—On June 19 issuance of \$16,500 in bonds for the purchase of one motor triple combination wagon, one combination chemical and hose wagon, and one tractor will be voted on. Charles Wassman is mayor.

Gallion, O.—City Auditor J. F. Hogan will receive sealed bids until July 6 at noon for 5 per cent fire engine bonds in sum of \$10,000.

Lisbon, O.—At regular election on Aug. 10, matter of bonding Lisbon for \$2,000 for purchase of motor driven chemical wagon will be submitted to voters of Lisbon. Clerk has been instructed by Council to file necessary resolution with board of deputy supervisors at once.

Springfield, O.—City has sold \$40,000 issue of bonds, to be used for purchase of motor apparatus and for other fire department improvements. Samuel F. Hunter is chief.

Butler, Pa.—Fire committee has been authorized to purchase necessary tires and other equipments for fire trucks.

Kittanning, Pa.—Fire Company No. 6, of 4th Ward, has been given assurance by city council at adjourned meeting of that body that council would appropriate from \$800 to \$1,000 for purpose of purchasing an auto fire truck for their use.

Towanda, Pa.—The Lin-ta Hose Co. is planning to purchase motor combination chemical and hose wagon and also more hose.

York, Pa.—The Laurel and Rescue companies are planning to motorize their chemical engines, and the Rex company is planning to purchase motor truck.

Waynesboro, Pa.—Committee of board of trade and property committee of borough council will recommend to council that it advertise for bids for motorizing Waynesboro fire department.

Williamsport, Pa.—Six companies have bid on the motor-driven combination street flusher and sprinkler. No action will be taken until bids are tabulated. Bids were received from W. U. Mussina, of this city, representing Keystone Motor Truck Co., General Motor Truck Co., Kinney Pump Co., Tiffin Wagon Co., Charles H. Vass Co. and Good Roads Machinery Co. Proposals ranged from \$3,700 to \$5,500.

Providence, R. I.—A request of Fruit Hill Volunteer Firemen's Association for 200 additional feet of hose, six badges, a ladder and numerous other accessories has been referred by town council to committee on fire supplies.

Dallas, Tex.—Four thousand feet of new fire hose will be purchased by fire department in short time. Commissioner Winfrey has prepared report recommending that city secretary advertise for bids on this amount of supplies, and that bids will be opened within a week or two.

Denison, Tex.—Installation of automatic fire alarm system at approximate cost of \$7,000; an automobile hook and ladder wagon, to cost about \$6,500, and an auto chemical wagon for the fire chief, the estimated expense to be \$500, are being considered to reduce insurance key rate.

Temple, Tex.—Before placing orders for new pieces of fire fighting apparatus which will be used in Temple, to be purchased with \$30,000 procured by means of recent fire bond issue, Chief Wright of Temple fire department is making tour of state, studying latest pieces of machinery. Waco, Fort Worth and Dallas are among cities being visited by the chief.

CONTRACTS AWARDED.

Lynn, Mass.—The Hallock Engine Co. of Cleveland, O., is constructing machine for fire department of this city which will be known as first aid auto chemical. Machine will only cost \$1,400 and meets needs of many cities and towns, where many runs are made and officials wish to run department at small expense. Apparatus consists of 35-gallon chemical tank, which is mounted on a special constructed Ford chassis made by the Ford Co. for fire department work. In addition the machine will carry one short ladder, two pony chemicals and other implements usually carried by a chemical.

Lowell, Mass.—To Robinson Fire Apparatus Mfg. Co., St. Louis, Mo., through M. F. Collins, of Boston, New England sales agent, for 850-gallon motor triple combination wagon with piston pump, an 80-hp. motor combination chemical and hose wagon, and one four-wheel 110-hp. tractor.

Camden, N. J.—After consideration of numerous proposals presented, fire committee of Camden City Council has decided that instead of buying new auto engines for five companies being refitted, it would motorize five engines and five combination wagons. Contract for this work was given to Commercial Truck Co. of Philadelphia, which will place tractors on ten pieces of apparatus for \$15,600. The Federal Motor Truck Co. was awarded contract for motorizing supply wagon at \$2,443. James Boyd & Co., of Philadelphia, was given contract for an 85-ft. aerial truck for \$10,692.86 and old Babcock aerial in exchange, and city service truck for \$5,592.86 and old truck in exchange. Same company is to supply combination engine and hose wagon for \$7,542.86 and old steamer in exchange. All apparatus will represent the very latest in fire-fighting appliance, driven by electric power.

Elizabeth, N. J.—It has been voted to purchase 1,000 ft. of new hose, 500 ft. from the Eureka Hose Co., and 500 from the Empire Hose Co. It has also been voted to award the contract for repairs to No. 1 engine house to Samuel Binder for \$1,000.

Susquehanna, N. Y.—Committee appointed by Chemical Engine Company has purchased new chemical engine with auto truck from the La France Company, Elmira, N. Y., for \$3,300, which is fully equipped with most modern apparatus and will largely increase efficiency of company.

Wheeling, W. Va.—Clerk has been authorized to order 600 ft. of fire hose from Fabric Co. of New York.

BRIDGES

Kennett, Cal.—A bridge across Sacramento River at ferry site of the town of Kennett, Shasta County, is being planned. It is estimated structure would cost \$20,000.

Placerville, Cal.—The Supervisors have decided to build wagon bridge across South Fork of American River at Coloma on strength of petition of 400 signatures.

Redding, Cal.—Bridge across Sacramento River at ferry crossing at town of Kennett is in prospect. Supervisors have requested County Surveyor to prepare plans and specifications to be submitted at next regular meeting of the Board. It is estimated in rough that suitable structure will cost \$20,000. At present county maintains free ferry at Kennett.

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Labor, 23,762 sq. ft. at 15c., removing and resurfacing	\$3,564.30
53 loads Binder at \$8.60	455.80
123 loads Asphalt at \$10.28	1,264.44
Total	\$5,284.54
Cost per sq. yd. via old method	2.00

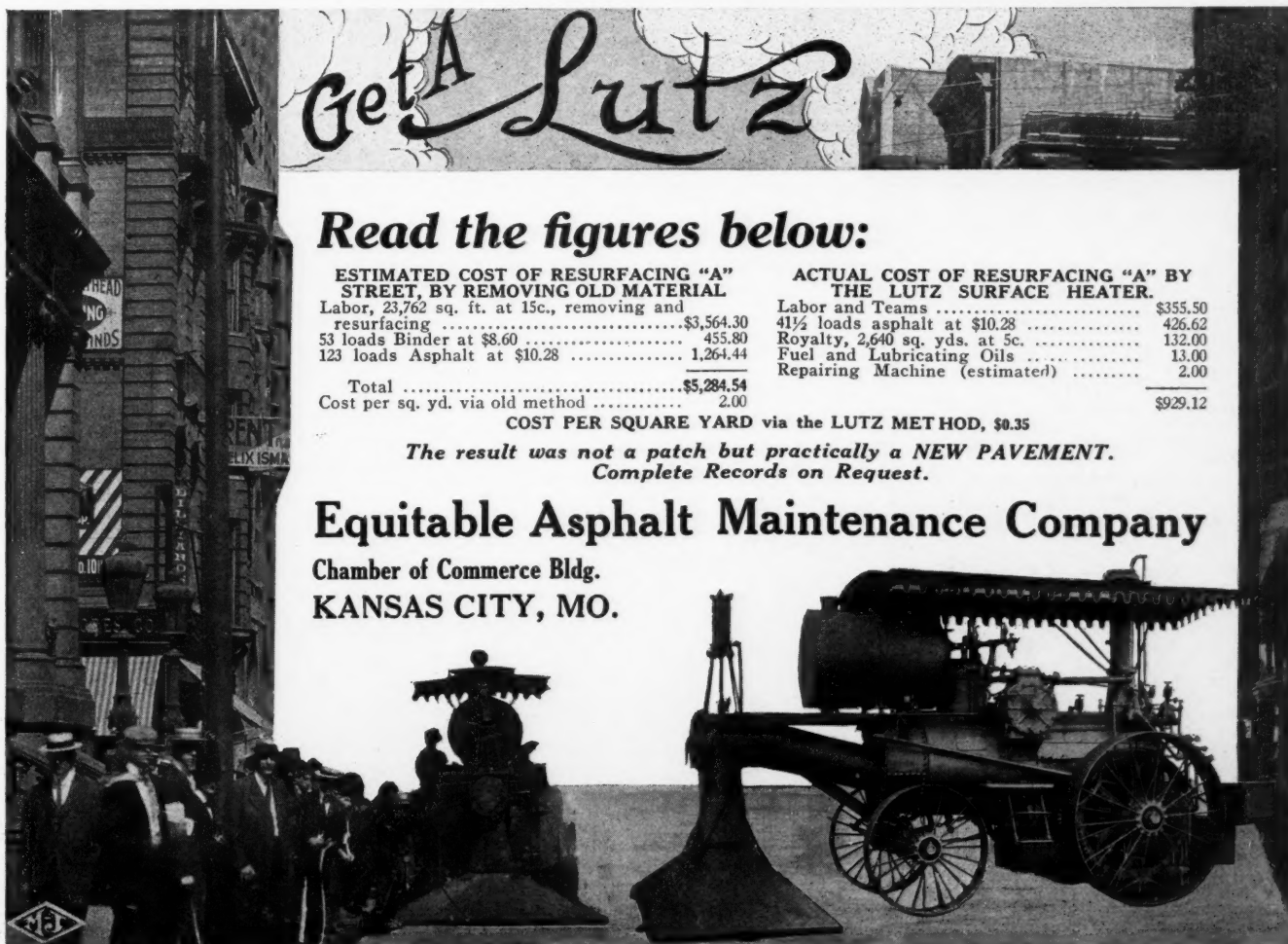
ACTUAL COST OF RESURFACING "A" BY THE LUTZ SURFACE HEATER.	
Labor and Teams	\$355.50
41½ loads asphalt at \$10.28	426.62
Royalty, 2,640 sq. yds. at 5c.	132.00
Fuel and Lubricating Oils	13.00
Repairing Machine (estimated)	2.00
Total	\$929.12

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Red Bluff, Cal.—County supervisors have accepted plans and specifications for four different types of bridges. Total length of 3 structures will be about 3,000 ft. Bids will be opened June 29.

Sacramento, Cal.—State Reclamation Board has approved plans of Supervisors of Placer County for construction of state highway bridge over Bear River, near Wheatland. Structure is to be of reinforced concrete.

Stockton, Cal.—Eight bids for construction of bridges over Middle and Old rivers have been opened at morning session of board of supervisors. All bids were taken under advisement. Although County Surveyor Frank E. Quail has not compiled his figures, it looks as though Tibbitts-Pacific Company is low bidder for construction of both Middle and Old river bridges. However, it will be at least two days before anything tangible regarding this fact is given out. Bid of Tibbitts-Pacific Company is estimated as follows: Old river—substructure, \$17,950; socket piling, \$14,820; superstructure, \$50,490; wooden pier block, \$53,789; protection piers, \$3,400. Middle river—substructure, \$19,515; socket piling, \$15,400; superstructure, \$48,930; wooden pier block, \$52,322; protection piers, \$3,400. Other bidders for work and whose bids are being considered are the Security Construction Company, Messner & Rice, Penn Bridge Company, Ross Construction Company, Thompson Bridge Company, The Midlin Bridge Company and California Construction Company.

Yuba City, Cal.—Sutter County supervisors have adopted resolution confirming their decision to share expense of repairing Meridian bridge. According to resolutions, Sutter County's share of expense is not to exceed \$50,000.

Kokomo, Ind.—County Commissioners have rejected all bids on Harper ditch bridge in Jackson township and decided to have present bridge repaired.

Richmond, Ind.—Contract will shortly be let for new bridge across White-water River, connecting N. 12th St. and the Middleboro Pike.

Richmond, Ind.—An abstract of report on south side bridge has been made by Bridge Engineer Mueller, who did not make recommendation because of absence of figures on reducing street grade on approaches to the structures. It will be three weeks before recommendation is made. The E St. bridge exclusive of approaches will cost \$141,000 or \$4.70 per sq. ft. of roadway. The G St. bridge will cost \$167,475 or \$4.62 per sq. ft. The length of the former will be 600 ft. and of the latter 725 ft.

Nashua, N. H.—A bond issue for \$20,000 will be asked for at next meeting of Board of Aldermen by Mayor James B. Crowley, as chairman of Board of Public Works, for repair and reconstruction of bridges around Nashua.

Dayton, O.—Construction of 5th St. bridge over Miami river, the Keowee St. bridge, spanning Mad river, leading to North Dayton, and the Webster St. bridge is being planned.

Eugene, Ore.—New wagon bridge across Coast Fork between Goshen and Pleasant Hill will be built of wood. Bids will shortly be advertised.

Doylestown, Pa.—Commissioners now have in contemplation erection of bridge over stream on road from Perkassie to Sellersville.

CONTRACTS AWARDED.

Auburn, Cal.—The Placer County Supervisors have awarded contract for construction of Coon Creek bridge to Jenkins & Wells, of Sacramento, for \$4,888. Bridge is to be of reinforced concrete.

Salinas, Cal.—The Monterey County Board of Supervisors have let contract for building steel bridge at Nacimiento station on state highway below this city to W. L. Gillham & Son, of San Jose. Contract price of bridge is approximately \$28,000.

Yreka, Cal.—The Penn Bridge Company of Pennsylvania has been awarded contract for building seven bridges between this city and Oregon line. The Eastern firm's bid was \$29,650.

Mt. Pleasant, Ill.—Plans for new bridge in Section 19 of Mt. Pleasant Township are now being made. Contract was let to L. S. Wallingford, of Prophetstown, and work will be started on it in a very short time.

Iowa City, Ia.—To O. M. Burnett, of Marengo, Ia., bridge contract for bridge on county line, between Johnson & Iowa Counties.

Great Bend, Kan.—Board of county commissioners has let contract for construction of different bridges to Heany Construction Co., of Enid, whose bid for entire lot was \$10,045, or \$57 less than estimate made by state engineer.

Beverly, Mass.—Public Service City Council Committee has awarded contract for new School St. bridge to Phoenix Bridge Co. of Philadelphia for \$5,456.

Duluth, Minn.—Commissioner Farrell has been authorized to erect concrete bridge over Mission creek at Fond du Lac and contract will be awarded to Rogers & McLean on their bid of \$2,588.

Mifflin, O.—Contract for construction of the reinforced concrete arch bridge over Alum Creek in the Agler road, Mifflin Township, was awarded by County Commissioners Humphrey, Sinclair and Davis yesterday to the Stewart Engineering Corporation of New York, on its bid of \$89,843.53. There were half a dozen higher bidders. Construction of west approach to the bridge was awarded by contract to W. O. Jewett, of Columbus, for \$3,814.60. Other bids awarded are: Taylor bridge, in Ridner & Taylor Pike, Plain Township, to F. A. Moorehead, Westerville, \$2,181.30; Shriver concrete arch bridge over Hayden Run in the Avery Pike, Washington Township, to W. O. Jewett, \$3,114.80; extending and repairing the Souder arch bridge, Jefferson Township, to F. A. Moorehead, \$2,368.76, and the Smoky Row road improvement in Marion Township to the Fritz-Rumer-Cooke Grant Co., of Columbus, for \$15,221.16.

Olympia, Wash.—Bid of Charles G. Huber, of Seattle, \$13,789, being low, commissioners of Thurston County and members of council of Tumwater have awarded him contract for new concrete bridge over Des Chutes river, just above falls at Tumwater.

MISCELLANEOUS

Dover, Del.—Bids will be received by State Treasurer, of Delaware, until July 1, 1915, at 10 o'clock a. m., for purchase of \$60,000 of state bonds of state of Delaware.

Wilmington, Del.—Building Commission bonds in sum of \$200,000 will be sold until noon, June 29.

Washington, D. C.—An American consular officer in Canada reports possible opportunity for sale of incinerator for disposal of garbage. It is stated that the proposed plant will cost about \$7,000. No. 17,285, Bureau of Manufactures.

Marianna, Fla.—City Council of Marianna has adopted resolution for appointment of committee to investigate prospects of installing municipal ice plant to be owned and operated by city in connection with water and light plants, already owned and operated by city.

Galesburg, Ill.—The erection of privately owned garbage disposal plant for city of Galesburg is a possibility in near future.

Marshalltown, Ia.—City is considering purchase of street cleaning machine. W. H. Steiner is City Engr.

Waterloo, Ia.—Town Criers will erect at least 100 attractive guide signs on Black Hawk County highways, stating correct distance between two towns and showing by map turns to be made between two points.

Monroe, La.—Walter G. Kirkpatrick, engineer, Birmingham, Ala., will report on condition of and improvements for water, light and traction systems, also sewers and pavements, as basis for \$400,000 bond issue. H. D. Apgar is Mayor.

Lynn, Mass.—Mayor Newhall has recommended that 1,000,000 sq. ft. of land in City Home property on Tower Hill be sold by city for building purposes, and that with proceeds lot of land on outskirts be bought suitable for city home and both city hospitals.

Bay City, Mich.—Purchase of motor vehicle for electric light department is being discussed.

Binghamton, N. Y.—Board has approved purchase of two-ton Chase motor truck, which is to be used by water department in hauling pipe and doing general work.

Brooklyn, N. Y.—Controller Prendergast has announced that on June 29 he will open bids for bond issue aggregating \$71,000,000. Rate of interest on these bonds will be 4½ per cent. Of proceeds of issue, \$46,000,000 is to be used to pay for completion of dual subway system, dock improvements and for water supply.

Brooklyn, N. Y.—Public Service Commission has authorized chairman and

secretary to advertise for bids to be opened Friday, July 9, at 12:15 p. m., for installation of tracks on New Utrecht elevated line.

Syracuse, N. Y.—As finally approved by State Canal Board, after having been accepted by Mayor Will for city and also by engineers of New York Central Railroad, entrance to proposed barge canal terminal from Onondaga Lake will be about midway between the old and new channels of Onondaga Creek. Plans are being perfected in office of State Engineer Williams, and that as soon as those are completed and specifications are finished bids for several contracts involved will be called for.

Cincinnati, O.—County Commissioners have adopted resolution authorizing issue of \$500,000 of 4½ per cent new Courthouse bonds to run for thirty years.

Niles, O.—See "Streets and Roads."

Philadelphia, Pa.—Mayor Blankenburg has signed ordinances necessary for erection of \$1,500,000 pier by city at foot of McKean St.

Wilkes-Barre, Pa.—Bids will be received at city clerk's office, Wilkes-Barre, Pa., until 12 o'clock, noon, June 30, 1915, for purchase of \$150,000 of issue of \$390,000 4½% city improvements bonds.

Providence, R. I.—Plans for new East Side police station to be built at Wayland Ave. and Sessions St. have been completed by Knight C. Richmond, architect, and cost estimates on structures are now being figured in office of Commissioner of Public Buildings.

Chattanooga, Tenn.—Mayor Litaletton has decided to sell \$220,000 city bond issue at auction, and notices to this effect have been sent out, fixing June 31 as the date of sale.

Beaumont, Tex.—Working plans for construction of Beaumont's first modern wharf and terminal facilities have been ordered by wharf and dock commission. Bids will shortly be advertised for and by time money is derived from \$100,000 bond issue voted May 21 contract will be let and work started immediately. Initial improvements contemplated call for expenditure of \$109,000.

Robstown, Tex.—Voters of Robstown district which includes approximately 196,000 acres, all susceptible to cultivation, will be called upon to vote 40-year bonds in amount of \$153,000 for purpose of providing drainage for district.

CONTRACTS AWARDED.

San Francisco, Cal.—Harbor Board has awarded to J. M. Coleman contract for furnishing crested piles for \$15,605.

Brooklyn, N. Y.—Revised figures of bids which have been opened by sinking fund commission for Section No. 1 of Nostrand Ave. subway, indicated that Newman & Carey were lowest bidders. This firm's bid was \$2,073,303.70. The Underpinning & Foundation Co. was next lowest bidder. They bid \$2,187,286.

Brooklyn, N. Y.—Public Service Commission has awarded contract for construction of Section No. 1 of Route No. 29, the Nostrand Ave. subway in Brooklyn, to Newman & Carey Co. of 215 Montague St., for \$2,073,303.20. The Newman & Carey Co. was lowest of fourteen bidders.

New York City, N. Y.—The public service commission has awarded contract for construction of Section 1 of Route No. 29, a part of Nostrand Ave. subway in Brooklyn to Underpinning & Foundation Company, the lowest bidder. This subway is branch of Eastern Parkway subway, and will be operated by Interborough Rapid Transit Company. Section No. 1 begins in Eastern Parkway and curves into Nostrand Ave., running south under Nostrand Ave. to point about 220 feet south of Church Ave. The Underpinning & Foundation Company's bid was \$2,179,000.

Utica, N. Y.—At recessed meeting of Board of Contract and Supply City Engineer Kemper reported canvass of bids for construction of subways, contract being awarded to John R. Baxter, Jr., as low bidder. He was awarded contract also for draining city subways and manholes. The bids for subways were: W. F. Cogley, \$46,466.20; N. D. Peters & Co., \$44,525; John R. Baxter, Jr., \$42,935.20; Frank M. Johnston, \$45,709.60; Domenick Perritano, \$43,860. Bids for the draining were: W. F. Cogley, \$2,609.50; N. D. Peters & Co., \$3,057.50; John R. Baxter, Jr., \$2,189; Frank M. Johnston, \$2,685.

Sheboygan, Wis.—By city to C. E. Hunter Co., Springfield, Ill., to construct garbage disposal plant at \$8,785.

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BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
O., Marion	Noon, June 26	36,264 yds. macadam and 12,500 yds. excavation.....	Pearl R. Mears, Engr.
O., Massillon	Noon, June 26	Paving with brick on several streets.....	J. A. McLaughlin, Clk.
Cal., Los Angeles	10 a.m., June 28	Furnishing 75 per cent road oil.....	H. B. Ferris, Sec. Bd. of P. W.
Cal., Los Angeles	2 p.m., June 28	Constructing oil macadam pavement, concrete pavement, culverts, etc.....	H. J. Lelande, Co. Clk.
Ill., Springfield	11 a.m., June 30	State highway work, including 2,640 yds. brick, 2,347 yds. macadam, 5,280 ft. concrete curb, 2,652 yds. excavation, etc.....	W. W. Marr, Ch. State Hwy. Eng.
O., Coitsville	2 p.m., July 3	Grading and improving road.....	Township Clerk.
Minn., St. Paul	10.30 a.m., July 6	Grading and improving several streets.....	Aug. Hohenstein, Pur. Agt.
Ind., Brazil	7.30 p.m., July 6	Oiling roads and streets.....	F. K. DeArmey, City Clk.
Miss., Meridian	10 a.m., July 9	Constructing and surfacing seven streets.....	J. O. Wise, Sec. of Comm.
Tenn., Columbia	July 10	Paving with asphaltic concrete.....	City Clerk.
SEWERAGE				
O., Massillon	Noon, June 26	Constructing sanitary sewers in five streets.....	J. A. McLaughlin, Clk.
Neb., Hastings	5 p.m., June 28	About 2,000 ft. sewer and sewer ditch to cost \$2,231.24.....	A. J. Bratton, City Clk.
Wis., Milwaukee	10.30 a.m., June 28	Laying 447 ft. 24-in. and 360 ft. 20-in. reinforced concrete sewer and 65 ft. 18-in. pipe sewers and nine manholes.....	L. M. Kotecki, Controller.
Minn., St. Paul	10 a.m., July 6	Constructing sewers in several streets.....	Aug. Hohenstein, Pur. Agt.
Cal., Los Angeles	10 a.m., July 6	Constructing pump house and installing machinery for sewage disposal plant.....	H. B. Ferris, Sec. B. P. W.
Neb., Grand Island	8 p.m., July 7	Constructing storm or storm and sanitary sewers.....	H. E. Clifford, City Clk.
WATER SUPPLY				
Cal., San Jose	11 a.m., June 28	29,000 ft. 1-in. galv. w. i. pipe, fittings, etc.....	H. A. Pfister, Co. Clk.
Minn., Clayton	July 3	Laying water mains.....	Burt T. Tietema, Vil. Clk.
Pa., Saltsburg	July 12	Furnishing 500,000 gal. pump.....	Robert H. Wilson, Chr. Water Com.
LIGHTING AND POWER				
Cal., Los Angeles	2 p.m., June 28	Installing lighting system and furnishing current.....	H. J. Lelande, Co. Clk.
Pa., Harrisburg	Noon, June 28	Lighting city offices and engine houses.....	J. K. Royal, Pres. City Council
Cal., Los Angeles	11 a.m., July 1	Furnishing and installing high-pressure boiler in school.....	Wm. A. Sheldon, Sec. Bd. Education.
FIRE EQUIPMENT.				
Pa., Collingdale	June 30	Two hose reels.....	W. T. Pharo, Chr. Fire Comm.
Utah, Ogden	June 30	Erecting new fire station.....	P. S. Browning, Comr.
Mich., Ann Arbor	July 2	Motor pumping engine and city service truck.....	Ross Granger, City Clk.
N. J., Plainfield	July 5	Motor combination chemical and hose.....	J. P. McMurray, City Clk.
Ariz., Phoenix	July 6	One piece of mortar apparatus; installing alarm system.....	R. A. Craig, City Mgr.
D. C., Washington	July 12	Furnishing fire, garden and steam hose for one year.....	Army Quartermaster.
BRIDGES.				
Pa., Harrisburg	11 a.m., June 28	Rebuilding bridge having 44-ft. span.....	Henry W. Gough, Co. Cont.
Ia., Muscatine	1 p.m., June 28	Constructing complete 10 reinforced concrete culverts.....	H. C. Schoemaker, Co. Aud.
Mass., Springfield	July 8	Steel-concrete bridge to cost \$40,000.....	Board of Supervisors.
Pa., Philadelphia	July 8	Constructing three bridges to cost \$134,000.....	M. L. Cook, Dir. P. S.
O., Marietta	1 p.m., July 20	Bridge construction.....	W. B. Alexander, Co. Aud.
MISCELLANEOUS				
Cal., San Jose	11 a.m., June 28	5,125 yds. crushed stone; 15 3,000 gal. redwood tanks.....	H. A. Pfister, Co. Clk.
Cal., Los Angeles	10 a.m., June 28	Furnishing stone dust.....	H. B. Ferris, Sec. B. P. W.
Ala., Sylacauga	6 p.m., June 29	Constructing concrete dam 250 ft. long and 9 ft. high.....	J. E. Jordan, City Clk.
Minn., St. Paul	10.30 a.m., July 6	Furnishing concrete and coarse asphalt sand; reinforcing steel, 1,000 yds. clean gravel or broken stone and 1,500 bbls. Portland cement.....	Aug. Hohenstein, Pur. Agt.

STREETS AND ROADS

Applegate, Cal.—Supervisors are to be asked to aid people of this community in matter of oiling country roads for one mile in four directions from this town.

Oroville, Cal.—By unanimous vote of City Trustees, resolution of intention to pave Montgomery St. from Lincoln St. to Fourth Ave., have been passed.

Sacramento, Cal.—State Highway Commission will receive bids for more than 20 miles of highways connecting in main \$18,000,000 system in counties of Tehama, Glenn and Contra Costa and also in Tulare County. Following are strips on which commission will call for bids: Tehama County, from Red Bluff to the northerly boundary of the county, 12.7 miles, to be graded; Glenn County, from Willows to Grapit, 9.4

miles, to be paved with Portland cement concrete; Contra Costa County, from El Cervo to Eckley, 3.5 miles, to be graded; Tulare County, from Goshen to Visalia, 6.4 miles, and from the westerly boundary of the county to the Southern Pacific Railroad, 3.9 miles, to be paved with Portland cement concrete.

Vacaville, Cal.—Voters have approved of appropriation of \$12,000 for paving of Main St., and route of State Highway through city.

Willows, Cal.—District Attorney Ben F. Geis is urging that State Highway Commission use old county road for one mile around Eucalyptus Farm, through which a right of way will cost \$4,200, in order to save money. He says county will save \$20,000 by so doing, as bridge over Walker Creek will be necessary if Eucalyptus route is taken.

Pekin, Ill.—The state aid road lead-

ing to South Pekin may be built of gravel instead of concrete.

Council Bluffs, Ia.—A resolution providing for paving of Canning St. east on River-to-River road from distance of 650 ft. east of Pierce St. to city limits, has been ordered prepared by Council, and if adopted will mean hard surfaced road from Pierce St. to point where cinders have been laid on highway by the Board of Supervisors. Resolution provides for 30-ft. roadway. Concrete will be used.

Oakland, Ia.—At last meeting of City Council it was decided to pave streets in business portion of city.

Hutchinson, Kan.—County Commissioner J. L. Ball has recommended purchase of two large tractor outfits, tractors and graders, for use on roads in Reno County.

Carrollton, Ky.—At special term of

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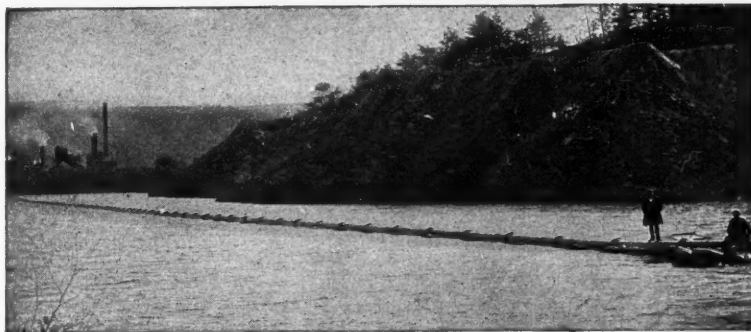
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MUNICIPAL JOURNAL
50 UNION SQUARE NEW YORK

County Court election was ordered for purpose of voting on issuing of \$50,000 in bonds for building and improving the county roads, election to be held August 6, 1915.

PROPOSALS

PROPOSALS FOR SEWERS.

Peoria, Ill., June 29th, 1915.

The County Court having, last week, confirmed the assessment roll for the SOUTH END SEWER, EAST SECTION, in this City, the undersigned Board will receive BIDS therefor until MONDAY, JULY 12th, NEXT, at 2 P. M.

The system includes, substantially:

7,824 ft. circular brick sewers from 30 to 72 inches,

9,177 ft. egg shaped brick sewers from 22 x 33 to 32 x 48 inches,

67,066 ft. vitrified pipe sewers from 8 x 24 inches, Manholes, catch basins; 2 concrete abutments.

Estimated cost, \$221,279.35

Proposals must be made out on blanks furnished at the office of the City Engineer, and be accompanied by cash or a check certified by a responsible bank for an amount of not less than 10% of the aggregate of the bid. Each proposal must be addressed to and the check made payable to the order of the President of the Board.

For the purpose of bidding, plans may be obtained from the Engineer upon the deposit of \$50, which will be refunded on the return of plans.

Work to be completed January 1st, 1917.

BOARD OF LOCAL IMPROVEMENTS,
Sherman W. Eckley, President.

INTERCEPTING SEWER IN TUNNEL.

Cleveland, Ohio.

Sealed proposals will be received at the office of the Commissioner of Purchases and Supplies, Room No. 511, City Hall, until 12 o'clock, July 7th, 1915, for constructing, under two contracts, in tunnel, approximately 7500 lineal feet of a 6-ft. circular brick sewer.

Copies of plans and specifications and blank proposals can be obtained at the office of the Commissioner of Engineering, Room No. 413 and 417, City Hall, after June 21st, 1915.

The proposal must contain the full name of the party or parties making the same, and all persons interested therein and must be accompanied by a proposal bond signed by a surety company authorized to do business in the State of Ohio or by a certified check for Five Thousand (\$5,000.00) Dollars, payable to the City of Cleveland, on a solvent bank, as surety that if the bid be accepted a contract will be entered into and the performance of it properly secured.

No proposal will be entertained unless made on the blanks furnished by the Commissioner of Engineering and delivered at the office of the Commissioner of Purchases and Supplies, Room No. 511, City Hall, previous to 12 o'clock M. (Eastern Time) on the day specified.

The City reserves the right to reject any or all bids.

A. R. CALLOW,

Commissioner of Purchases & Supplies.

TREASURY DEPARTMENT. Supervising Architect's Office, Washington, D. C., June 14, 1915.—Sealed proposals will be opened in this office at 3 p. m., July 26, 1915, for the construction complete (including mechanical equipment, lighting fixtures, and approaches) of the United States post office at Webb City, Mo. One-story-and-basement building, 4,500 square feet ground area; fireproof construction throughout, except roof; stone facing; composition roof. Drawings and specifications may be obtained from the custodian of site at Webb City, Mo., or at this office, in the discretion of the Acting Supervising Architect. Jas. A. Wetmore, Acting Supervising Architect.

HIGHWAY WORK.

OFFICE OF THE STATE COMMISSION OF HIGHWAYS.
Albany, N. Y.

Sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at

1 o'clock p. m., on Wednesday, the 7th day of July, 1915, for the repair of highways in the following counties:

Albany (two contracts—Resurfacing); Broome (one contract); Cayuga (two contracts—Resurfacing and Surface Treatment); Columbia (4 contracts—Surface Treatment); Delaware (one contract—Surface Treatment); Dutchess (one contract—Resurfacing); Erie (one contract—resurfacing); Franklin (one contract—Surface Treatment); Greene (one contract—Surface Treatment); Herkimer (one contract—Resurfacing); Madison (one contract—resurfacing); Monroe (one contract—Resurfacing); Oneida (5 contracts—Resurfacing and Surface Treatment); Ontario (two contracts—Resurfacing and Surface Treatment); Orange (one contract—Surface Treatment); Rensselaer (one contract—Resurfacing); Rockland (two contracts—Resurfacing); Saratoga (one contract—Resurfacing); St. Lawrence (two contracts—Surface Treatment); Schenectady (one contract—Surface Treatment); Suffolk (one contract—Surface Treatment); Westchester (one contract—Surface Treatment).

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of the Division Engineers in whose divisions the contracts are to be repaired. The addresses of the Division Engineers and the counties in which they are in charge will be furnished on request.

The especial attention of bidders is called to "INFORMATION FOR BIDDERS" in the itemized proposal, specifications and contract agreement.

EDWIN DUFFEY,
Commissioner.

I. J. MORRIS,
Secretary.

HIGHWAY WORK.

OFFICE OF THE STATE COMMISSION OF HIGHWAYS.
Albany, N. Y.

Sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1 o'clock p. m., on Tuesday, July 13th, 1915, for the improvement of highways in the following counties and also for the following repair contracts:

Broome (approx. 3.15); Chenango (2 highways, 7.78; 4.02); Jefferson (2 highways, 2.86; 2.40); Lewis (3 highways, 2.00; 8.82; 1.27); Montgomery (approx. length 7.10); St. Lawrence (approx. length 5.50); Schoharie (approx. length 4.79); Schuyler (2 highways, 6.03; 1.11); Steuben (3 highways, 9.09; 3.42; 7.31); Sullivan (approx. length 0.72); Tompkins (approx. length 3.04); Westchester (approx. length 4.32); Wyoming (2 highways, 1.53; 6.99); Delaware, 1 contract (resurfacing); Ontario, 1 contract (resurfacing); Suffolk, 1 contract (resurfacing).

Sealed proposals will also be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1 o'clock p. m., on Thursday, July 15th, 1915, for the construction and repair of highways in the following counties:

Broome, 1 highway (approx. length 0.91); 1 contract (resurfacing); Catiaraugus (approx. length 0.93); Chautauqua, 4 highways (1.51; 0.77; 3.55; 0.93); Cortland (approx. length 0.23); Erie, 2 highways (0.34; 0.59); Fulton (approx. length 2.12); Monroe, 1 highway (approx. length 1.53); 3 contracts (resurfacing); Montgomery (approx. length 3.81); Nassau (approx. length 1.57); Onondaga (approx. length 0.27); Ontario (approx. length 1.38); Otsego, 2 highways (12.66; 2.52); Rockland (approx. length 2.95); Steuben, 1 highway (approx. length 1.72); Suffolk (approx. length 3.25); Ulster (approx. length 2.97); Warren (approx. length 5.13).

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the offices of the Division Engineers in whose divisions the roads are to be constructed or repaired. The addresses of the Division Engineers and the counties in which they are in charge will be furnished on request.

The especial attention of bidders is called to "Information for Bidders" in the itemized proposal, specifications and contract agreement.

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PROPOSALS FOR STREET PAVING

Lebanon, Pa., June 15, 1915.

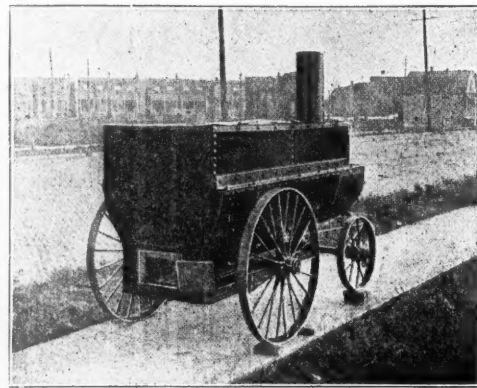
Sealed proposals will be received by the Mayor and Council of the City of Lebanon, Pa., until 5 o'clock P. M. on the 1st day of July, 1915, for furnishing all materials and doing all work necessary for the complete construction of about 4,000 square yards of street paving on 8th Street, between the N. side of the tracks of the Philadelphia & Reading Railroad Co. and the N. side of Lehman Street; separate proposals for the paving of 9th Street from the S. side of Chestnut Street to near the S. rail of the Philadelphia & Reading Railroad Co.'s tracks, comprising about 12,400 square yards of pavement and a separate proposal on Lehman Street from the E. side of 4th Street to the W. side of 9th Street, comprising about 8,300 square yards of pavement. The above quantities are approximate only.

Specifications, forms of proposals, envelopes, etc., may be obtained from the office of the City Engineer. A certified check on a solvent bank must accompany each bid. Three hundred and sixty dollars for 8th Street, Eleven Hundred Dollars for 9th Street and Seven Hundred and Fifty Dollars for Lehman Street bid. All checks must be drawn in favor of the City of Lebanon, Pa. The payments for the cost of paving and curbing the said highways shall be from amounts to be collected by the City Treasurer from property owners whose land fronts or abuts on said highways upon the basis authorized, and that the City of Lebanon shall under no circumstances be held responsible for the payment of any part of the cost of said improvements except as to the cost of the paving of intersections of said streets and alleys and the paving or curbing in front of properties exempt by law from the paying of said improvements.

The right to reject any or all bids or parts of bids is hereby reserved. Address communications to

T. R. CROWELL, City Engineer.
Attest, DAN M. SHARP, City Clerk.

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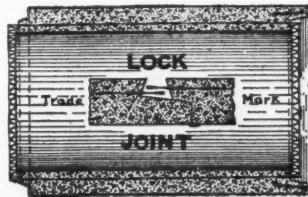
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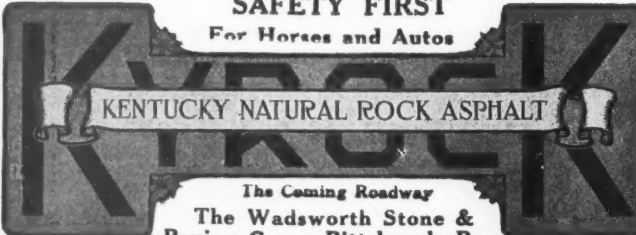
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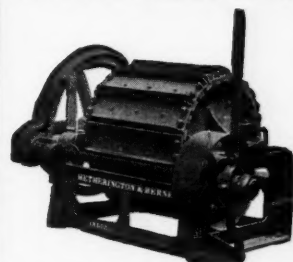
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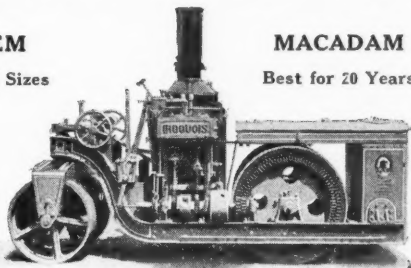
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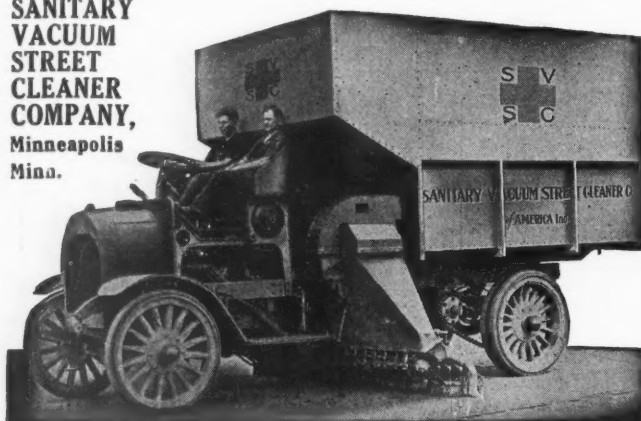
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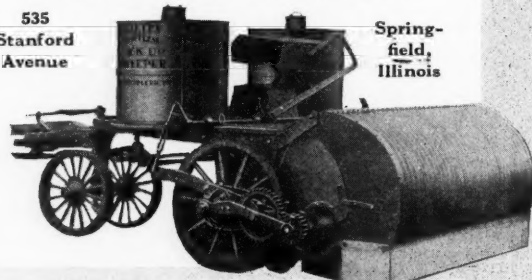
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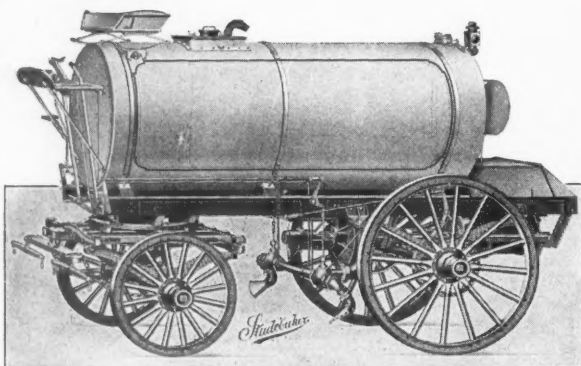
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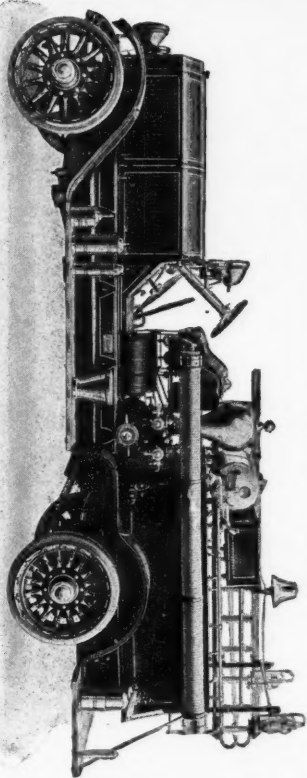


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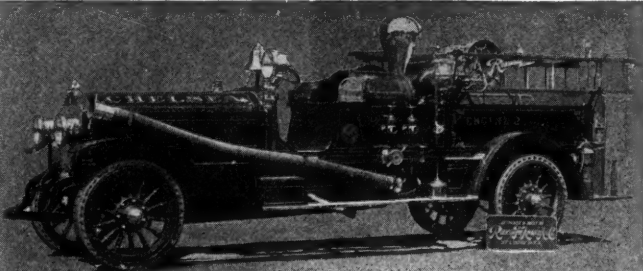
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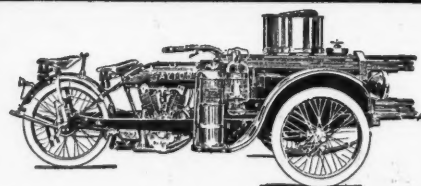
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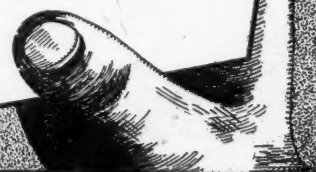
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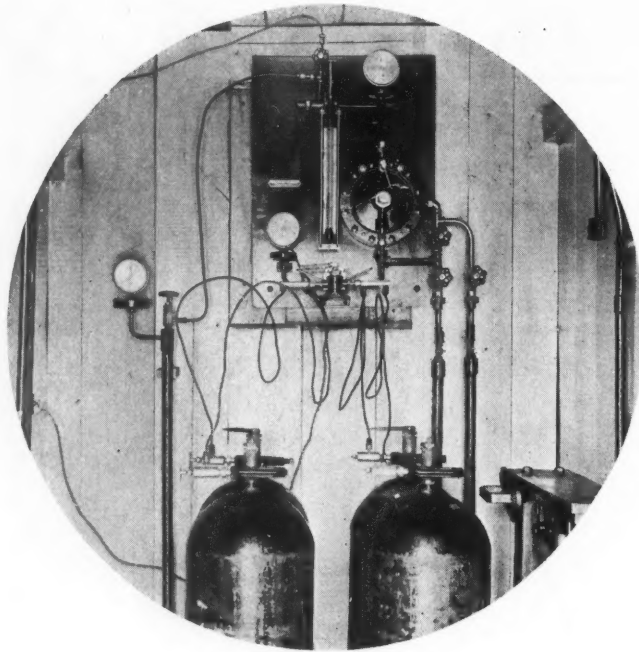
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